Upper School Program of Studies
2018-2019

The Pembroke Hill School
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Graduation Requirements

The Pembroke Hill curriculum is comprehensive in scope, encompassing a full complement of courses in Computer Science, English, the Fine Arts, Language, Mathematics, Physical Education, Science, and Social Studies. It has been carefully planned so as to foster full and sequential skill development. We believe that this curriculum will ensure that our academic program provides excellent preparation for college, while remaining flexible enough to meet the individual needs of our students.

Pembroke Hill students are required to complete successfully 20 units of academic courses and 1.5 units of Physical Education. Please note that a “unit” in this instance means a full year, or two semesters. In particular, students will be required to complete:

- **4 years of English**, must be enrolled in English each semester.
- **3 years of Mathematics**, must enroll in a year-long Mathematics course each year through the junior year with a minimum completion of Algebra II.
- **3 years of Social Studies**, must complete The World to 1500, The World Since 1500, and American Civilization History.
- **3 years of Science**, Biology is required in 9th grade and Chemistry is required in 10th grade.
- **3 years of Language**, must complete two consecutive years of the same language. The third unit may be completed by starting a new language.
- **2 years of Fine Arts**, must complete two 1/2-unit courses: Visual Arts and either Theatre Arts, Debate I or Exploration in Music. The remaining 1 unit may be completed in either Performing or Visual arts offerings.
- **2 years of electives**
  - **1.5 years of Physical Education**, must earn 1.5 units through our athletic program and/or our Physical Education program.
- **Community Service**, all upper school students must complete a minimum of **60 hours of community service** by the last day of senior exams in the upper school in order to be eligible for a diploma.

Program Options

The Program of Studies has been prepared to assist students and their parents in planning an academic program for the upper school. Selections should be made after considering the goals of each student and after consulting with academic advisors and administrators at the school.

Graduation requirements are intended to serve as a minimum standard for a student. All students are required to take five courses each semester, but no sophomore, junior or senior may take more than six classes without advisor and administrative approval. Physical Education does not count toward the five-course requirement. Assuming a normal load, students will graduate with the minimum of 20 units of academic credit. However, most students will complete several more units of credit. Students who wish to carry a different academic load may petition the principal for approval.

Personal and career interests should be considered when deciding how many advanced courses to take in each department. We would expect our most capable students, who are interested in applying to highly selective colleges, to take a broad distribution of subjects at the Advanced Placement level. Four-year planning should be done with advisors, taking into consideration academic and extracurricular goals.

Schedule Change Policy

We have found it nearly impossible to schedule students in their courses and, at the same time, attempt to honor student and family requests for a particular teacher. Therefore, we will not accept requests for a specific teacher unless there is a compelling reason. During the advising and course planning process, an advisor, teacher, or parent can make a request in writing for special consideration. This request should include the compelling reason for special review and be signed by the parents and the advisor.

If scheduling has already occurred, requests for change will be divided into categories:

1. **Mandatory**: scheduling error, graduation requirement. These will be changed as soon as possible.
2. **Desirable**: administrative or teacher change to maintain class balance, gender balance, etc.
3. **Discretionary**: [Note: A request to move from a smaller class to a larger class will not be honored.]

If a problem occurs after the first day of classes, a request for change can be made if parents, advisor, college advisor (if a senior), and the appropriate department chair agree that there is a compelling reason. Changes will be considered only during the first days of each semester for semester-long courses, and during the first days of the school year for year-long courses.
No student may enroll in any course after the first mid-quarter of the semester, nor may any student withdraw from a course after the completion of one quarter.

**Advanced Placement and Accelerated Courses**

Each department has established criteria for student enrollment in Advanced Placement sections. Students enrolled in A.P. sections are expected to take the A.P. examination unless exempt upon appeal to the teacher, the department chair, and the principal.* Juniors enrolled in A.P. courses are expected to have a second semester final evaluation. Seniors will follow the senior exam policy.

Students are assigned to sections in English, language, and mathematics courses by the faculty and department chair. Students should consult with their language and mathematics teachers to determine the appropriate section in which to enroll.

*A.P. exams cost approximately $90 per exam. Parents will be billed through the business office.

**Independent Study for Credit**

Independent study is an option available to students, not as a substitute for courses offered, but as an opportunity to pursue an interest in-depth or to study an aspect of a discipline not available through the existing curriculum. Students interested in independent study must obtain the cooperation of the teacher or teachers with whom they wish to work and submit a written proposal to the Academic Dean. The proposal must include:

- a) a clear statement of goals;
- b) a detailed explanation of ways to meet those goals;
- c) the signatures of the college counselor, the department chair and the teacher or teachers supervising the project;
- d) the time to be allocated to the project and;
- e) the credit desired, if any.

The Upper School Academic Dean, the chair of the appropriate department, and the cooperating teacher(s) will constitute an ad hoc committee that must approve the proposal. Final approval for independent study credit must be granted by the principal.

**Independent Study, Non-Credit**

Many students undertake a non-credit independent study project at some point during their upper school years.

Non-credit independent study projects can be short or long term (from one week to a year) and take a variety of forms: A student may pursue a special interest in-depth, focus on a special aspect of a course, work in the community, shadow a professional, teach a mini-course, or pursue any number of other possible projects. Student independent work is evaluated by a faculty committee and shared with his or her peers.

Students must be sponsored by a faculty member and must submit their project proposal to the head of the Independent Study Committee for approval.

**Community Service**

The goal of the upper school Community Service program is to foster a sense of community responsibility. Through volunteer service, students will gain a greater understanding of social and moral issues. It is our belief that service to the community is one of the major characteristics of leadership. Those who serve also lead. Those who lead also serve. This concept is reinforced by requiring completion of a minimum of 60 hours of community service to charitable causes. Summer community service programs, January Interim Week service projects, and organized weekend service projects are examples of the ways to meet the requirement. Twenty of the 60 hours may be completed within the Pembroke Hill School community, although it is not mandatory.

To encourage the habit of serving the community, each student must perform a minimum of 5 hours of service each year of upper school enrollment, (June 1 to May 31) regardless of the total accumulation. Final year-end grades will be withheld until the yearly community service requirement is met. Each time community service is performed, the student must fill out a form, complete with signature from an adult at the agency where work was performed, and return it to the director of community service.

For students who are not enrolled in the upper school for four years, 15 community service hours per year are required.
### Graduation Requirements Worksheet

<table>
<thead>
<tr>
<th>Subject</th>
<th>Grade 9</th>
<th>Grade 10</th>
<th>Grade 11</th>
<th>Grade 12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>English</strong> (4 years required)</td>
<td>English 9</td>
<td>English 10</td>
<td>American Civilization English</td>
<td>AP English 12</td>
</tr>
<tr>
<td><strong>Mathematics</strong> (3 years required)*</td>
<td>World to 1500</td>
<td>World Since 1500</td>
<td>American Civilization History</td>
<td></td>
</tr>
<tr>
<td><strong>Social Studies</strong> (3 years required)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Science</strong> (3 years required)*</td>
<td>Biology or Biology Accelerated</td>
<td>Chemistry or Chemistry Accelerated</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Foreign Language</strong> (3 years required—2 of which must be consecutive levels of the same language)</td>
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<td></td>
</tr>
<tr>
<td><strong>Fine Arts</strong> (2 years required, including one semester of Visual Art Foundation and one semester of the following: Theatre Arts, Debate I or Exploration in Music. The remaining 2 semesters may be completed by taking any combination of Performing and/or Visual arts offerings)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electives</strong> (4 semester courses required. May come from any department where student has exceeded graduation requirement)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physical Education</strong> (1.5 years)*</td>
<td>Concepts of Physical Fitness (0.75 units)</td>
<td>Lifetime Physical Fitness*</td>
<td>Lifetime Physical Fitness*</td>
<td>Lifetime Physical Fitness*</td>
</tr>
<tr>
<td>*See Reverse</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*4 units strongly recommended or required by many colleges/universities

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**OVER**
ADDITIONAL UPPER SCHOOL CURRICULUM AND SCHEDULING INFORMATION

- Students need **21.5 total units** to graduate from Pembroke Hill (20 academic units and 1.5 units of Physical Education). Please note that a “unit” is a full year, or two semesters.

- In addition to the academic requirements spelled out on the reverse, students must complete **60 community service hours** in order to graduate (5 hours must be completed each year regardless of a student’s accumulated hour total).

- Students must be enrolled in a minimum of 5 courses, and a maximum of 7 courses, each semester. NOTE: Independent Study courses taken for credit and Global Online Academy (GOA) classes each count toward this total.

- No sophomore, junior or senior may take more than 6 courses per semester without advisor and administrative approval.

- **Physical Education** – P.E. does not occupy a “class period,” per se, in a ninth grader’s daily schedule. All 9th graders are enrolled in “Concepts of Physical Fitness” and they receive 0.75 P.E. credits for the successful completion of this class (consisting of regular lectures delivered during Meetings Period and two 30-minute workouts per week—completed during study hall and/or after school). Students must then satisfy the remaining 0.75 units of the P.E. requirement by playing a PHS sport(s) or by enrolling in “Lifetime Personal Fitness” for 3 additional quarters.

- **Art Focus Students**
  - Performing Arts – Students who choose a Performing Arts focus may forego the introductory Performing Arts Foundation classes (Exploration in Music, Debate I or Theatre Arts). Students may declare a focus in one of four areas: acting, choral music, instrumental music, or debate. These students will meet with a Performing Arts teacher in their chosen area to map out their four-year focus commitment. Students who fail to meet this commitment, however, will be required to complete an introductory Performing Arts Foundation course.
  - Visual Art – Students who choose a Visual Art focus are allowed to bypass the Visual Art introductory course and enroll in Drawing I as the first step. The commitment that the student agrees to is a 4-year focus in the Visual Arts; he/she agrees to take at least one visual art class each year and, furthermore, the student agrees to take AP Studio Art in his/her junior and/or senior year. If the Visual Art Focus student does not enroll in the AP Studio Art course, or if it is dropped before completion, the student must fulfill the Visual Art introductory course requirement.

- **Four-Year Choir or Four-Year Band Students** – Students who intend to remain enrolled in Choir or Concert Band for their entire Upper School careers are allowed to skip the Foundation Performing Arts classes (Exploration in Music, Debate I or Theatre Arts). Four-year choir and four-year band students need only complete one additional semester course in the Visual Arts to satisfy their Fine Arts graduation requirement. Any student who chooses to drop Choir or Concert Band prior to completing the four-year sequence, however, is then required to complete an Foundation Performing Arts course.
The Library

The Kemper Library provides materials that enrich and support the curriculum, taking into consideration varied learning styles, diverse ethnic backgrounds, and age appropriateness. Through small groups and individual instruction, students are introduced to the many resources available to them, including specialized reference works, a variety of online databases, scholarly journals, the book and film collection, and the collections of other libraries in the community.

The library program strives to equip students with skills that enable them to become independent researchers, competent in locating and using a variety of information sources. Throughout their four years in upper school, students develop and practice research skills in conjunction with a variety of classroom assignments across the curriculum. They are coached and guided in how to map out effective, logical strategies for gathering information relevant to their research topics that include learning how information is organized and successfully retrieved in the library.

Literature appreciation is an important component of the library program. The Summer Reading List, on the Pembroke Hill website, offers titles recommended by the faculty in addition to the required work of literature for each grade level. As opportunities become available, students have the chance to meet and listen to visiting authors read and discuss their literary works.

Our school motto, Freedom with Responsibility, embodies the uniqueness of a school library environment where students experience more freedom and autonomy in responsibly self-directing their academic studies.
Computer Science and Technology

In today’s world, computer science and technology touch every aspect of our lives. Programming, software development and engineering have long since moved out of the lab and into every field from medicine, banking and exploration to commerce, entertainment and sports, to name only a few. With this in mind, the Pembroke Hill Computer Science and Technology seeks to prepare graduates for any approach they might take in their study of this discipline, from building and maintaining systems, to writing apps and shaping user experience, to creating robots to solve problems.

The Computer Science and Technology department allows students to focus on any of three areas: Programming, Engineering and Design.

- **Programming**-focused courses include Web Design & App Development, Introduction to Python, Introduction to Java, and Advanced Placement Computer Science.
- **Engineering**-focused courses include 3D Printing & Design, Computer Architecture & Server Design, and Introduction to Robotics.

There is no computer science requirement for graduation.

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**AP Computer Science** (Fall and Spring)

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

**Web Design & App Development** (Spring)

In this course, students will be introduced to the suite of languages used to develop web applications, HTML, CSS and JavaScript. Any application created in these languages can be accessed and used on any device with a web browser, making web applications one of the most universally accessible options for software developers. Students will practice these skills through guided builds of simple designs, interactive games like Magic 8 Ball, Rock Paper Scissors, Simon, and others. Students will finish the semester by creating a project of their own design. Along the way, students will learn about domain registration, file transfer protocol, and popular JavaScript libraries like jQuery.

**Computer Architecture & Server Design** (Fall)

This course will focus on basic computer architecture and how to build, maintain, and run computers and servers. Students will take a hands-on approach and create a server using spare computer parts and open-source software. Topics of study may include hosting and creating websites, file management, media sharing, games security, and email. Additionally, students will gain a basic understanding of networking and protocol.

**Introduction to Python** (Fall or Spring)

Python is a robust and powerful programming language that is free and easy to use. Python is also considered a user-friendly computer language that serves as a gentle introduction to programming for future studies in computer science. Students will learn the basics of the object-oriented Python programming language and start coding.
Students will be confronted with mathematical problems that can be solved through programming, as well as explore aspects of programming that appeal to their specific interests. Throughout the course students will gain a proficiency in basic programming and problem solving skills. Both beginning and advanced programmers are welcome (no previous programming skills are required). This course can be used as the prerequisite for AP Computer Science.

**Introduction to Java**  
(Fall or Spring)

This one-semester course introduces students to Java programming with emphasis on the object-oriented paradigm for both conventional and website applications. Java is the language used for the AP Computer Science exam. Students will construct simple to complex programs as they strive to achieve the most efficient method of problem solving while creating a strong programming base for other languages or the AP class. This course can be used as the prerequisite for AP Computer Science.

**Introduction to Robotics**  
(Fall)

How would you build a device that can repeatedly toss a frisbee through a goal with perfect accuracy? Or drive around and pick up and stack a series of crates on itself? What about a machine that can lift itself off the ground? Each year, Pembroke Hill’s robotics team, The Legion, solves these problems and more as it competes in the FIRST Robotics competition in Spring. This involves designing, building, testing, and ultimately fielding an actual robot in competition against other local schools. This course will cover the basics of building robots for the FIRST competition. Students will learn about construction, electronics, motors, simple machines and much more in a hands-on environment. We will examine the success and failures of previous strategies and devise new ones for new challenges. Participation on the robotics team is not required to join this class, but students who have taken the course will be qualified to join the team without training.

**3D Printing & Design**  
(Fall and Spring)

With applications in art, design, engineering, manufacturing, and medicine, 3D printing will be a relevant subject for many years to come. In this course, students will explore the implications of 3D printing as one of the most exciting innovations in the last two decades, and will learn how to use 3D modeling software to design and create 3D printing projects. These projects will actually be printed on one of our MakerBot Printers in PLA and ABS plastic.

**Computer Graphics**  
(Spring)

Tired of “borrowing” images from a Google search rather than making your own? Would you prefer to create a meme or GIF rather than just forward someone else’s? Ever wonder how you might covert your doodles into digital images or animations? In Computer Graphics, we will learn the basics of several programs in the Adobe Creative suite, including but not limited to Photoshop, Illustrator, and Flash. Topics will include digital image editing, using scalable vector graphics to create original graphics, simple animations and even some simple CSS-focused web design. There is no pre-requisite for this class.
In Upper School English classes, our students continue to develop the ability to read closely and to defend plausible interpretations of the text. Using literature as the vehicle, we teach students to be critical human beings. At each grade level, we expose the students to complex texts across all genres, including poetry, drama, fiction, and nonfiction. Another cornerstone of the English class is leading students through the writing process of literary analysis. But before students begin that process, teachers engage them in Socratic-like discussions to excavate details, identify incongruities, and theorize motives. Often using these discussions as a springboard, students will write up to ten essays per year, both in class and out of class. Since there are no miracles when it comes to writing, teachers stress the hard work of revision for grammar, style, and ideas as they provide their students with individualized feedback. While the pen and paper essay has mostly disappeared, the process of drafting a coherent persuasive essay has not. Teachers still spend significant time teaching grammar, punctuation, diction, sentence construction, and paragraph organization.

In the first three years, students take year-long English courses. With each year, students are challenged by more nuanced and sophisticated works of literature that require them to formulate analytical arguments of increasing levels of complexity. Within each grade level, teachers incorporate some type of research essay that includes outside sources, such as literary criticism. As a result, students move beyond the classroom discussions to enter the broader intellectual conversation. Another requirement at each level involves public speaking. From short, impromptu speeches to the thirty-minute senior capstone presentation, students practice their oral presentation skills in front of their peers. In the final year of English, seniors choose from a selection of topics in the first semester while all seniors take the capstone class during the second. These courses during first semester, similar to undergraduate courses, consist of more focused topics on, for example, a genre-like short story or a thematic idea such as Existentialism or The Other. For the capstone semester, seniors propose an individualized research project that serves as their culminating research and writing for the department.

English 9

The ninth grade year is a critical one: it is a year of transition and a year of beginning. The groundwork begun in middle school – in grammar, mechanics, vocabulary, writing, reading and research – is reinforced. Attention to grammar and punctuation is maintained with the consistent use of the Hacker Manual on every major writing assignment. Students will be expected to experiment with a variety of styles and forms in analytical writing, as well as personal essays, and move beyond the paragraph level to that of the full-length paper. In literature, students study the basic genres of fiction and are introduced to non-fiction as they learn the fundamental skills of literary and rhetorical analysis, including a unit on poetry. In order to prepare students for the concentrated emphasis on literary analysis in the upper school, the ninth grade year is dedicated to developing the vocabulary and techniques of argumentation. From the outset, teachers will cover the basic components of claims, reasons, evidence, and underlying assumptions that constitute clear and effective persuasive writing. From there, students make the natural progression to literary argumentation while exploring such works as The Absolute True Diaries of a Part-Time Indian, Catcher in the Rye, The Merchant of Venice, The Odyssey, The Glass Menagerie and others.

English 10

Tenth grade continues the work begun in ninth to move students from the concrete details of plot summary to the abstract interpretations of theme, character, symbol, and metaphor. Teachers present students with increasingly more complex works and challenge them to write in more sophisticated ways, edging away from
the formulaic constructions of the five-paragraph essay. For example, students are asked to produce a variety of arguments that stress coherence and develop a particular tone through their diction while incorporating textual evidence within their own interpretations. During the fourth quarter, students write a research paper that accesses literary criticism and other secondary sources and are encouraged to enter the larger conversation about a text. The core of the tenth grade reading list centers on four distinct lenses that are chosen by the tenth grade teachers. Each of the topics receives consideration in terms of the works read and the essay prompts assigned. For example, the first quarter may be dedicated to the topic of psychology and literature, focusing on the concepts of Freudian theory that are reflected in characters’ motives and struggles. The rest of the year may include works such as *Othello* or *Macbeth*, *The Raisin in the Sun*, *The Metamorphosis*, *The Elegance of the Hedgehog* and *Frankenstein* with other quarter perspectives such as philosophy and lit, gender and lit, and social class and lit.

**American Civilization (English 11)**

Although not necessarily taught chronologically, the junior year in English does touch on the development of the American voice in literature beginning with the Puritans and reaching into the twenty-first century. In the process, the course explores the Romanticism of Hawthorne and Poe, the Transcendentalism of Emerson, the Realism of Crane and Twain, the modernism of Fitzgerald and Hemingway, and contemporary masterpieces by Morrison and others. Additionally, the course explores larger themes that run concurrently throughout American history and American literature, such as the tension between authority and rebellion and the importance of expansion to the American psyche. The course builds on the skills emphasized in the ninth and tenth grade years, further developing a student’s ability to engage in close reading and to formulate analytic arguments in writing. There is a special emphasis on understanding and employing rhetorical devices, increasing awareness of experience with different critical schools of thought, as well as providing opportunities for growth as a public speaker. In conjunction with the history department, juniors are engaged in four interdisciplinary projects, one each quarter. The AmCiv projects can involve a key text, but they also tap resources in Kansas City such as a locally produced film/documentary, an exhibition at a museum, an outside speaker, or a historical landmark. After juniors encounter the object of study for the quarter, both English and history teachers take the next few days to examine it from their particular discipline, revealing that overlapping perspectives are crucial to understanding and exploring ideas.

**AP English 12**

The English department has fashioned the senior year to be the culmination of all that Pembroke Hill students have accomplished in the previous three years of English courses. With that in mind, the literature read is more complex, the discussions are more nuanced, and the writing assignments are more layered, often including secondary sources and literary criticism. As seniors sign up for their fourth and final year of English, they have a limited choice in the topics of the class. The semester-long class will be taught by one senior English teacher and focuses on a topic, genre, format or theme that lends itself to a more intensive study of literature in preparation for undergraduate English courses. Seniors will have a different teacher during the second semester to lead them through the capstone research project. The project includes multiple steps that allow students to explore a topic of interest that likely was not covered in the traditional curriculum. Whichever combination of teachers and research topic that a senior experiences, the rigor is comparable and matches the requirements of the AP curriculum. Therefore, all students will be classified as taking AP English 12. Below is a short description of the possible courses offered to seniors.
Second Semester Capstone Course

The last semester of the senior year is devoted to the Senior Capstone Project. During this semester, the Senior Capstone Project is an opportunity for each student to explore in depth a topic of interest in a traditional research format, with an experiential element as well. The English Department looks to the Senior Capstone Project as a means for every student to work within multiple disciplines using a variety of research methods, including a field expert and personal experience, to explore an essential question and provide an actionable proposal that often has stakeholders in the local community. Students will read and take notes from peer-reviewed journals; they will identify trends and contradictions through collaboration with faculty and peers, and explore areas of academic interest to pursue further in the future. The two final requirements for this course are as follows: a formal essay and an oral presentation on their Senior Capstone Project to faculty, students, and parents.
Senior English Courses
Fall Semester of 2018-2019

Creative Writing Workshop

Creative Writing will offer the student an opportunity to explore their own voice through various
genres, including the poem, the short story, the stage or screenplay, and the literary book review. Students will
spend time outside of class reading books of contemporary poetry (these will be recently published books, so
titles pending) and short-fiction (including Charles Baxter & Mary Gaitskill), and also exemplary stage and
screen plays (Three Billboards Outside Ebbing, Missouri) depending upon their selected focus, and will write
book reviews for selected collections. However, the bulk of production will focus on original creative work in
their chosen genre. Students will be expected to read one another's work with as much attention and vigor as
they give a published writer. The in-class time will primarily be spent in workshop, presentations, or exercises
directed at writing in the various genres.

Marginalized Voices

It is an unfortunate fact of our world that inherent in the existence of a powerful majority is also the
presence of a marginalized minority. This group, or rather, groups, are often posited as “the Other”, different
from that which is perceived to be dominant and thus the norm. For centuries, the voices of these groups have
been suppressed and their stories relegated or ignored. This course will explore the writings, ideas, and tales of
these groups alongside the historical and contemporary contexts surrounding them.

The first half of the semester acts as an introduction to the course. Authors such as Edward Said,
James Baldwin, and Judith Butler will provide contextual theory to the texts we read whilst we consider the
mechanisms and means by which these voices continue to be posited as “Other”. We will explore the
challenges that come with trying to find a place in a world that continues to tell you that you do not belong, as
well as considering the value that can come from embracing literature emphasizing culture, race, and sexuality
among other topics. We will look at works by such authors as Chimamanda Ngozi Adichie, Ta-Nehisi Coates,
and Alison Bechdel, amongst others.

Students will have more autonomy in the second half of the semester as the course adopts the tutorial
approach favored by such schools as Oxford and Cambridge. During this time, students will curate their own
reading lists based on a desire to explore the literature of a particular marginalized group. This half of the
semester will be structured around weekly tutorial meetings where students will need to come prepared for a
rigorous discussion and exploration of their topic, and then larger entire class seminars.

The “Oxford-Style” Tutorial
or
You are What You Read

The study of literature is best pursued with the spark of passion, or at the very least, curiosity. The
University of Oxford, followed by Cambridge and others, developed and now relies upon a very old tradition
of learning based upon self-directed reading and weekly meetings between professors and individual students.
In addition to attending lectures and participating in informal discussions with their peers, students at Oxford
are “assessed” by their teachers during weekly meetings where they present a formal, academic writings on a
selected subject and attempt to defend their findings and conclusions in that very moment. Students are
generally at liberty to choose topics that interest them, but must research a topic and synthesize a thesis that
stands up to the rigors of academic inquiry.
This course will adopt the spirit of the tutorial approach, modified to fit the contours of the academic realities of this institution. As this is a literature course, all topics must relate to the world of letters in some regard. During the first part of the year, all students will choose literary topics related specifically to humanity’s relationship with technology. As the distinctions between humans and machines continue to blur, students in this class will read fiction devoted to that idea. Lectures, generated by instructors from the Pembroke Hill school and the wider community of intellectuals, will present interesting aspects of this domain of writing and students will prepare themselves for their respective tutorials by reading novels, short stories, poems, and drama that relate to the genre of literature. On a weekly basis, students will meet in their tutor groups to reveal their interpretations of these readings. The second quarter provides students with even greater freedom as the list of topics will expand to include approaches and inquiries into substantive dilemmas that vex the thinking man or woman. Thus the tutorial group then becomes a space where students’ own literary interests become the focus of the curriculum. New groups will coalesce along shared interests and students will collaborate to examine problems, ideas, and solutions from a plurality of perspectives. To reiterate, the preparatory readings and requisite essays must meet the standards of academic discourse.

**Dissenting Bodies: A Literary Exploration of the Ab/Normal**

This course is designed to cultivate advanced reading and writing skills as we dive deeply into questions about the body. In other words, you will sharpen your skills as a reader, writer, and thinker as we closely examine and question the representation and construction of normal/abnormal, acceptable/unacceptable, beautiful/ugly bodies in culture/literature. As we read a range of texts from the nineteenth-century to today, from short fiction, to graphic histories, personal essays, memoirs, and critical pieces, we will ask complex and weighty questions of the stories being told around us. How do we decide what bodies should be cured and fixed? What is the relationship between our bodies and gender? What meanings have we ascribed to thin/fat bodies? By the end of the semester, you will be able to speak to and find connections between critical theory, personal experience, and cultural construction of marginalized bodies in the stories being told around us. The fundamental driving force of this course is to think critically about the subtle and established bodily norms distributed throughout our culture in the stories we tell.

**Spring Semester of 2018-2019**

**Capstone Course**

The last semester of the senior year is devoted to the Senior Capstone Project. During this semester, the Senior Capstone Project is an opportunity for each student to explore in depth a topic of interest in a traditional research format, with an experiential element as well. The English Department looks to the Senior Capstone Project as a means for every student to work within multiple disciplines using a variety of research methods, including a field expert and personal experience, to explore an essential question and provide an actionable proposal that often has stakeholders in the local community. Students will read and take notes from peer-reviewed journals; they will identify trends and contradictions through collaboration with faculty and peers, and explore areas of academic interest to pursue further in the future. The two final requirements for this course are as follows: a formal essay and an oral presentation on their Senior Capstone Project to faculty, students, and parents.
Fine Arts

Both Performing Arts and Visual Art departments offer entry-level courses. The Performing Arts Department offers Theatre Arts, Exploration in Music or Debate I, and the Visual Arts Department offers Visual Art. Each semester course fulfills the 1/2 credit introductory requirement in each area. All sections are offered fall and spring and may be taken in whichever order is preferred. The only exception to this is Debate I, which meets only in the fall to allow students to participate in the debate season. These courses are available to upperclassmen, but are highly recommended for freshmen and sophomores.

Upon completion of the entry-level course in the respective arts area, students will have the opportunity to enroll in more specialized courses in that area. Exceptions to this sequence will be explained in the Performing Arts and Visual Art sections.

Students must have maintained a grade of B+ or better and receive teacher approval before being allowed to take any performing or visual arts course for the second time. Also, no one will be allowed to repeat a visual or performing arts class for a third time. Independent work for advanced students may be allowed with departmental approval.

Those students who have a passion for the Fine Arts and have the dedication to develop their artistic talents may want to pursue the Arts Focus Program.

Performing Arts

The philosophy of the Performing Arts branch of the Fine Arts Department is: To develop self-esteem through artistic expression and aesthetic awareness in the performer and the non-performer alike; to meet students at their individual artistic levels, whether beginning or advanced; to promote a lifelong appreciation and support of the arts through the development of skills, knowledge, and experiences. Emphasis is placed on individual skill development as well as ensemble work. Academic course work in areas of music, theatre, and speech/debate is offered to widen a student’s understanding and appreciation of the performing arts.

Arts Focus was created for those students who will advance their talents beyond secondary education or who show substantial talent and dedication to a particular arts area. In the performing arts, students will choose, as they enter the upper school, to focus in one of the following areas: acting, choral music, instrumental music, or debate. These students will meet with a Performing Arts teacher in their chosen area who will help them map out their four-year focus commitment. This commitment must be made before or during their freshman year. Students who choose this focus option will not be required to take the entry level offerings unless they do not fulfill the four-year focus commitment.

Entry Level Foundations Courses:

The Performing Arts Department offers three foundations courses:

Theatre Arts
Exploration in Music
Debate I

Upon completion of any of these courses, students can enroll in our more specialized offerings.
**Theatre Arts (Foundations Course) (Fall or Spring)**

This course serves as an introduction to the Theatrical Arts, in which students will explore the history and significance of theatre as communication practice. Additionally, students will investigate how social and political changes can affect theatre/theatrical expression and identify elements of cultural preservation in theatre. Basic techniques of script analysis, character development, directing, and design will also be introduced as we work through significant periods in theatre history.

**Exploration in Music (Foundations Course) (Fall or Spring)**

This course is designed for students who would like to increase their general knowledge of what music means in our world. We will approach this from an historical as well as a "hands-on" approach to all of the components that make up this complex art form. Upon completion of this course, a student should have the tools to be a life-long learner in music.

**Debate I (Foundations Course) (Fall)**

This course will serve as an introduction to the basic elements of competitive speech and debate. Students will have the opportunity to study Public Forum, Policy, and Lincoln-Douglas styles of debate. Additionally, students will be exposed to foundation elements of Extemporaneous Speaking, Student Congress, and other individual events--including acting events. Specific attention will be paid to universal debate theory, argument construction, flowsheeting, presentation techniques, audience adaptation, and research methodologies. Students will be required to participate in a minimum of three interscholastic tournaments during the semester.

**Upper School Choral Performing Groups:**

The Pembroke Hill Choirs have a long tradition of excellence. These groups have the opportunity to perform three concerts, as well as Handel’s *Messiah*, each year. Participation in festivals, contests, and special trips is also part of the choir year.

**The Pembroke Hill Chorale (Full Year)**

This chorus will consist of juniors and seniors who enjoy being part of a choral ensemble and enjoy making music together as a team. The members of this group will have many opportunities for positions of leadership within the context of the choral ensemble. Chorale will learn and perform many standard choral works, as well as challenging contemporary and popular songs. Emphasis will be placed on music reading, blend of voices, *a cappella* singing, being part of an ensemble, and paying attention to fine detail in music. Concert Choir and Chorale will rehearse and perform together throughout the year. Excellence in both the rehearsal and performance processes will define the goals of the ensemble.

**The Pembroke Hill Concert Choir (Full Year)**

This chorus will consist of freshmen and sophomores who enjoy being part of a choral ensemble. The group will learn and perform many standard choral works, as well as challenging contemporary and popular songs. Emphasis will be placed on music reading, blend of voices, *a cappella* singing, being part of an ensemble, and paying attention to fine detail in music. Concert Choir and Chorale will rehearse and perform together throughout the year. Excellence in both the rehearsal and performance processes will define the goals of the ensemble.
The Pembroke Hill Madrigal Singers  (Full Year)
Prerequisite: Formal audition with Director of Choirs and acceptance into the ensemble.

Madrigal Singers is a select choir of SATB voices offered by audition only. Membership will be comprised of sophomores, juniors, and seniors. Independent preparation and personal commitment to the ensemble are required as Madrigal Singers serves composers, performers, and listeners by presenting choral performances of the highest quality possible. The following vocal/musical skills for ensemble singing will be stressed: proper vocal production, blend and balance, sight-reading proficiency, ear training, expansion of range, technical facility, a cappella singing, and dynamic nuances. Various languages and genres will be incorporated in the repertoire, designed to challenge and perfect the musicianship of every member. Excellence in both the rehearsal and performance processes will define the goals of the ensemble. Homework (practicing) will vary with the individual.

The Pembroke Hill Concert Band  (Full Year)

The Pembroke Hill Upper School Concert Band is available to all students grades 9-12, who play woodwind, brass, or percussion instruments and are seeking music performance opportunities. This year-long elective provides a creative and educational environment for upper school instrumental music students to develop successful sight-reading, ensemble, and music performance skills. Performing experiences include Concert Band, Jazz Ensemble, Pep Band, and Chamber Music Club.

Upper school band students will develop their musicianship through regular rehearsals and performances scheduled throughout the school year. In addition to two required concert performances (winter and spring), the ensemble will travel, perform, clinic, and listen to other ensembles in the Kansas City Metropolitan area.

Performing Arts Semester Course Offerings:

Music History  (Fall)
Prerequisite: Exploration in Music or Departmental Approval

This course is an in-depth study of styles, forms, and composers of music. Students will discover the chronology of music from Gregorian chant up to the beginning of the Twentieth Century. We will explore the evolution of music, as well as many aspects of music that have remained the same for hundreds of years. Students will gain knowledge of the major composers, pieces, and events that have shaped the music we know today. This course is offered every year in the Fall.

Music Theory I  (Fall)
Prerequisite: Exploration in Music or Departmental Approval

This course is the study of the form, notation, and organization of written music. Students will learn to read, compose, and understand written music as a new language. Students do not need to have extensive background in music to take the course. They need only to have the desire to discover and create written music. The course will lead up to an individual composition project created by the end of the semester. Students will be using MIDI music theory and composition software. This course will alternate between first and second semester every year.

Music Theory II  (Spring)
Prerequisite: Music Theory I

This course will take the concepts learned in Theory I and expand on them. Students will also be exposed to additional complexity in notation and analysis of music. Compositions will be more intricate and polished.
Students who take Theory I and Theory II consecutively may opt to take it as an Advanced Placement course. This course is offered every other year in the spring.

**Music Appreciation** (Fall)  
*Prerequisite: Exploration in Music or Departmental Approval*

Do you like chant? How about Bach? Mozart? Beethoven? What about Pearl Jam? Did you know that they all used the same things to write their music? Do you want to find out what those things are? This course has everything from Palestrina to Presley, Bach to the Beatles, Mozart to Dave Matthews. If you feel like learning the ABC’s of what makes music what it is, bring your ears and an open mind and find out! This course is offered every other year in rotation with Music Theory I.

**Music of the Twentieth Century** (Spring)  
*Prerequisite: Exploration in Music or departmental approval*

What do a bale of hay and a butterfly have to do with music? You’d be surprised to find out all the strange sounds that composers have called “music” in recent history. Either as a separate course, or a continuation of the Music History course, this class will be an intense look at the music of the past century. From the abandonment of tonality, to the advent of Rock and Roll, it was an interesting period. Come hear all the music you missed before you were born. This course will be offered every year in the Spring.

**Music Technology** (Fall or Spring)  
*Prerequisite: Exploration in Music or departmental approval*

This semester long course is intended to provide students a platform for expressing their musical creativity and interests. Students will learn how to write, arrange, compose, loop, and manipulate sound using their iPads. Assignments and units will be project based and most work will take place during class time. Whether you’re an advanced musician, someone interested in the technical side of music, or simply interested in exploring the world of music on the iPad, this class is for you.

**Theatre Arts** (Fall or Spring)

This course serves as an introduction to the Theatrical Arts, in which students will explore the history and significance of theatre as communication practice. Additionally, students will investigate how social and political changes can affect theatre/theatrical expression and identify elements of cultural preservation in theatre. Basic techniques of script analysis, character development, directing, and design will also be introduced as we work through significant periods in theatre history.

**Acting I** (Fall)

This course is designed to introduce the fundamentals of acting through an exploration of ensemble, operational vocabulary; and a focus on self-awareness, collaboration, storytelling, and confidence. We will explore these elements through creative lecture, discussion, exercise, improvisation, script analysis, scene and monologue work.

**Advanced Scene Study** (Spring)  
*Prerequisite: Acting I or Instructor Approval*

This course is designed to build upon the knowledge and skills established in Acting I and help students develop their own individual approach to acting. Specific attention will be paid to movement, research, and period styles from a variety of historical contexts from Commedia Dell’ Arte and Shakespeare to Oscar Wilde.
Theatre Lab (Fall)
Prerequisite: Theatre Arts, Acting I or Instructor Approval

Creativity and collaboration are concepts found in all disciplines, nowhere more so than in the theatre. The course is designed to allow students the opportunity to develop creative abilities through experiences in performance-based arts and apply these in a collaborative project. Students will work alone and in groups to develop solutions to dramatic and practical problems. Students will perform in a short play within class time and crew on all other projects therein when necessary. Coursework will culminate in a showcase open to the community on an evening in December prior to finals week, in which all students are expected to participate.

Directing (Fall)
Prerequisite: Elements of Theatrical Design or Instructor Approval

Under the guidance of the instructor, students will direct or stage manage a brief scene/One-Act of their choosing. We will explore the challenges of directing with special attention to the practical problems and aesthetic questions that arise. Particular emphasis will be given to spatial relationships and the development of an aesthetic perspective. In this course, student directors and stage managers will advance their ability to effectively and collaboratively communicate their vision for a production by learning critical strategies. Through play selection, casting, and scenework, students will acquire a deeper understanding of a director's responsibilities. Coursework will culminate in a showcase open to the community on an evening in December prior to finals week in which all students are expected to participate.

The Directing course is designed to be taught inside the Theatre Lab class section as an advanced level course for those interested and meeting the necessary qualifications.

Elements of Theatrical Design (Fall or Spring)
Prerequisite: Theatre Arts

This course is designed to build a fundamental understanding of technical elements related to theatrical arts. It will provide insight into the perspectives and experiences of theatrical technicians by examining the individual roles related to collaboration, concept, and construction of a variety of technical elements. Topics will include: directing, stage management, prop construction, costume construction, lighting design, and scene painting. During this course, students are expected to participate in the construction and creation of technical elements for both the upper school musical and spring play, which may require thoughtful clothing choices to avoid undue damage or restriction.

Auditioning (Fall or Spring)
Prerequisite: Acting I, Acting II, or Instructor Approval

Auditioning provides students with a broader understanding of the techniques required to approach the professional world. Topics covered will include company research, professional resume creation, monologue preparation, musical theatre, improvisation, head-shot selection, casting agencies, and cold readings. Students will exit the course with a “package,” including an updated professional resume, audition-ready monologues, and a song. Additionally, students are expected to participate in a professional audition for the Coterie Theatre’s Artistic Director, Jeff Church.

Movie Making (Spring)

The class is designed for students interested in digital storytelling, cinematography, producing, acting, and the editing of short films. Students will learn the basics of film-making working in groups to develop their own original short films and are expected to act and crew in numerous on-camera exercises for their fellow classmates.
**Debate II (Full Year)**  
*Prerequisites: Debate I*

This course will build upon the knowledge and skills developed in Debate I. Intermediate debate theory and practices will be addressed, in addition to Intermediate presentation and research techniques. Specific attention will be paid to intermediate theory and techniques of Extemporaneous Speaking, Original Oratory, and Student Congress, in addition to other individual events. Students will be expected to prepare both a debate event and at least one individual event for tournament competition. Students will be required to participate in a minimum of three interscholastic tournaments during each semester.

**Advanced Debate (Full Year)**  
*Prerequisites: Debate II*

This course will build upon the knowledge and skills developed in Debate II. Advanced debate theory and practices will be addressed, in addition to advanced audience adaptation techniques, extensive original research, and advanced argument construction. Specific attention will be paid to advanced theory and techniques of Extemporaneous Speaking, Original Oratory, Student Congress, and Public Forum. Students will be expected to prepare both a debate event and at least two individual events for tournament competition. Students will be required to participate in a minimum of four interscholastic tournaments during each semester.

**Advanced Speech (Spring)**  
*Prerequisites: Exploration of Music, Theatre Arts, or Debate I Foundations Course*

Advanced Speech will serve as an introduction to practical speaking. The course will cover topics ranging from informative speeches, demonstrative speeches, persuasive speeches, and interviewing. Students will learn basic best-practices of public speaking and advanced skills in rhetoric. A performing arts foundation course is required as a prerequisite.

**Discussions in Contemporary Issues (Spring)**  
*Prerequisites: Exploration of Music, Theatre Arts, or Debate I Foundations Course*

Contemporary Issues will examine the national and international issues that define our global landscape. The course will examine these issues from political, social, and philosophical perspectives. Curriculum may include topics that are affecting the Pembroke Hill community, our mission, or topics that students are concerned about. This class is a seminar that will require the participation of students in discussions, presentations, and advocacy positions on discussed issues.
Visual Arts

The intent of the Visual Art program is to develop visual thinkers and to encourage creative problem solving through idea generation; ideas are implemented using structured and sequential learning. The art curriculum is designed to develop unique mental capabilities, which foster flexible, divergent, original, fluent, and imaginative thinking. Students are engaged in making art, looking at and reflecting on art through analysis as well as learning about the cultural, social, and historic context of art.

From the general Visual Art course through the AP Studio Art Portfolio course, students of any interest or ability level will gain aesthetic awareness and develop perceptual and analytical skills. Students expand their ability to express and develop ideas through a variety of visual media and practice discussing artwork using the vocabulary of artists: the elements of art and principles of design.

Visual Art Focus

The art department seeks to identify those students with a passion for art and who have the capability, as well as the dedication, to pursue the development of a portfolio by senior year. A strongly developed portfolio will more than likely enhance the student’s success in the college admissions process.

An art department faculty member may recommend an interested student at any time from 8th grade or after. A student may also request a portfolio review to join the Visual Art Focus program. Students accepted into this program are allowed to bypass the Visual Art course and enroll in Drawing as the first step. The commitment that the student and parents will agree to is a 4-year focus in the Visual Arts, in which the student participates in at least one visual art class each year. In addition, focus students are assured a spot in an art class of their choice each year. The culmination of the visual art focus is the AP Studio Art Portfolio class (See course description). It is understood that if the Art Focus student does not enroll in the AP Studio course, or if he chooses to drop the focus at any time during her enrollment, the student must fulfill the introductory Visual Art course requirement.

Visual Art Semester Course Offerings

Visual Art (Fall or Spring)

Visual Art is the mandatory introductory art course in the upper school. The Art Department recommends the Visual Art course to be taken in the 9th or 10th grade. Passing this course will allow the student to enroll in more specialized art electives.

This course provides the framework of knowledge and skills upon which the upper school art courses build. Students will learn to see and think like an artist and will develop skills using a variety of tools, materials, and techniques. Students will practice the language of art. They will develop visual thinking and creative problem solving skills in diverse art forms. Students will gain understanding of 2- and 3-dimensional design through application of the elements of art: line, shape, form, composition, value, and color theory as well as the principles of design: unity, variety, balance, emphasis, rhythm, repetition, scale, and contrast. The student’s intentional use of content, composition, and craft will be included in assessments. Students will develop the perceptual skills crucial to visual art, including methods of visual analysis.

Drawing I or II (Fall or Spring)

*Note: This course serves as the entry level art course for all Visual Art Focus students.*

Drawing is approached as a skill based on perception and hand-eye coordination. Students will gain basic knowledge of wet and dry media. They will successfully execute contour line drawing, gesture drawing, and value
drawing techniques. Student work will explore the challenges of drawing with a variety of media and subject matter. They will understand the visual perceptions: Line quality, Value, Composition, and Perspective. Students will differentiate among representational, abstract, and conceptual approaches to art. They will also develop the ability to recognize major periods, artists, and works of art, and the ability to analyze and critique a work of art using the formal language native to visual art. Students with a grade of B+ or better may enroll in Drawing a second time for more advanced drawing experiences.

**Painting I or II (Spring)**

Students will develop perceptual and creative thinking skills through the universal language of painting. Acrylic, oil, and watercolor media may be used in the exploration of still life, landscape, figure, portrait, and non-objective subject matter. Color theory will be stressed as well as developing skills and knowledge of composition. Students will experience priming and preparing canvas and paper, experiment with handling the media, and advance through development of various techniques toward personal expression. The study of historic forms of expression in painting will enrich the students’ awareness and provide stimulus for specific painting problems. Students will be responsible for purchasing and cleaning their own brushes. With a grade of B+ or better, students may enroll in this course a second time to experience more advanced painting problems.

**Silversmithing I or II (Fall or Spring)**

Design and fabrication skills necessary for working in sterling silver, copper, and brass will be covered in this course through exploration of techniques such as soldering, constructing, casting, stone setting, forging, enameling or cloisonné. Major emphasis will be on the aesthetics of design and an individual, creative approach with completed drawings to be submitted for each project. Through observation of the works of contemporary metalsmiths as well as those of ancient cultures, students will learn to recognize the unique qualities of metal and its possibilities for their own designs. Students will be responsible for purchasing their own metals and saw blades. Students who receive a grade of B+ or better in Silversmithing may enroll in the course a second time for Silversmithing II credit.

**Ceramics I or II (Fall or Spring)**

This semester course introduces students to a variety of clay-building techniques. Students will apply methods—including coil, pinch, slab, and wheel-thrown—appropriate for solving particular design problems. Concerns of both sculptural and functional forms will be investigated. This course emphasizes applying principles of design essential to three-dimensional art. A variety of finishing and glazing techniques will be explored. The historical evolution of ceramics is studied as a framework for developing designs and processes. Students who complete the course with a grade of B+ or better may take the class a second time.

**Photography (Fall or Spring)**

This semester course is a complete introduction to the 35 mm of photography. Technical aspects of the SLR camera, black and white film developing, and print processing are covered in depth. Some functions of digital photography and processing are also included. Projects are designed to emphasize creativity, composition, and technical processes.

Students do not need to provide their own camera for the course, but are welcome to use their own if desired. Students will sign out cameras and other equipment for use with each assigned project, with the understanding that it must be cared for and used properly. Students must also furnish film, print paper, and other minor materials available at the PHS bookstore. Students must provide their own transportation for travel to shooting locations in various parts of the city after school and on weekends; signed transportation forms must be updated.
Advanced Studio Art (Spring)  
(Not to be confused with AP Studio Portfolio)

This is an advanced art course for a student who wish to continue exploration of studio art practice and begin development of their personal vision in body of work (a portfolio). This course can follow or precede AP Studio. The pursuit of personal ideas and creative thinking will be emphasized, in conjunction with the expansion of technical skills. Students will explore drawing, two-dimensional, and three-dimensional design through studio practice and research. A wide range of techniques will be studied, utilizing the Elements of Art and Principles of Design, as well as various media including: drawing, painting, printmaking, photography, ceramics, sculpture, jewelry, collage, and mixed media. Students will be encouraged to investigate art from various cultural, social, and historical backgrounds, which will include contemporary artists and movements. Students will engage in regular critique and written reflection to aid in developing and articulating personal ideas. As the course progresses, students will select media and subject matter that best communicates their ideas and strengths, creating a small body of work with a cohesive theme. *Prerequisite: two semesters of visual art courses.*

Advanced Photography (Spring)

The Advanced Photography course aims to expand upon skills and understanding of the photographic medium learned in Photography I, with an emphasis on students developing a personal, artistic voice through their imagery. Students will pursue advanced techniques and ideas as they work to solve more complex visual problems in photography, and will learn more about the art as communication through both the creation of photographs and participation in group critiques. Students will explore aspects of the black and white darkroom, digital camera, and digital darkroom as well as alternative photographic processes. Students who complete the course with a grade of B+ or better may take the course a second time. *A grade of B+ or better in the Photography I course is a prerequisite for enrolling in Advanced Photography.*

Making Comics (Fall or Spring)

How do words and pictures interact to make the symbolic system that we call sequential art, graphic literature, cartoons, or comics? In this course, students will explore this question as they develop their abilities as writers and observers through planned and spontaneous drawing and story-telling. Focus will be on developing the student’s drawing, story generation, and 2D design skills as well as mastering the conventions and concerns of the comics medium. Both autobiography and fiction will be explored as content. Activities and assignments will consist of drawing, designing, journaling, and writing, leading to the production of a multi-page original comic. Discussion of comics history and analysis of graphic literature will inform the student’s creative work. *Prerequisite: Visual Art or Drawing.*

Printmaking I or II (Offered every two years)

Students will explore a unique means of personal expression resulting in the creation of multiple original images. Through the various printmaking methods—monotype, relief (linoleum-cut), intaglio (etching or engraving), lithograph, screen print, or a combination of methods—students will develop drawing and design skills. The organization of pictorial ideas and individual creativity will be encouraged through the multitude of creative possibilities in printmaking. With a grade of B+ or better, students may enroll in Printmaking II to experience more advanced printmaking problems.
Sculpture I or II  (Offered every two years)

This course allows students to explore concepts of three-dimensional art. Students will build objects that occupy physical space and learn how to evoke interest in the space around them. Through the study of historical and contemporary sculpture, they will learn formal concepts of 3-Dimensional design. By using volume, mass, line, space, and texture, they will utilize new approaches to visual communication to explore ideas. Students will investigate methods of additive and subtractive sculpture to fabricate expressive objects out of various materials such as clay, wood, plaster, metal, and found objects. Students will have an opportunity to solve problems that are physical, visual and conceptual as they explore contemporary approaches to sculpture. With a grade of B+ or better, students may enroll in Sculpture a second time.

Visual Art Year-long Course Offerings:

AP Studio Art:  (Full Year)
Drawing Portfolio
Two-Dimensional Design Portfolio
Three-Dimensional Design Portfolio
(Junior Year / Senior Year)

Prerequisites include: Art Focus commitment, courses in 2-D and/or 3-D areas each year so that students are in a position by the middle of junior year to choose from the three Portfolio options listed above.

The Advanced Placement Studio Art opportunity is intended for the highly motivated student who wishes to pursue serious study in the Visual Arts. The fulfillment of the rigorous portfolio requirements is developed over the year and compiled in the spring for the AP exam. Students will investigate a wide range of materials as they develop artwork that communicates their personal voice and vision. Students are expected to work at school and at home throughout the school year. The students’ work may be produced prior to the AP Studio course. It is strongly recommended that the student use the summer prior to the AP Studio year to take pre-college art courses or a pre-college art residency program at a college or university.

Students will be expected to produce approximately 30 works of art in a variety of media, techniques, and subject matter. Each portfolio requires submissions in three distinct sections: Quality, Concentration, and Breadth.

AP Studio Portfolios:  (students will each select one area from the options below)

The Two-Dimensional Design Portfolio demonstrates proficiency in 2-D design using a variety of art forms. These might include, but are not limited to, digital imaging, photography, graphic design, typography, collage, fabric design, illustration, printmaking, etc.

The Three-Dimensional Design Portfolio addresses a broad interpretation of sculptural issues that investigate depth and space articulated through additive, subtractive, and/or fabrication processes such as ceramics, sculpture, silversmithing, and 3D digital design.

The Drawing Portfolio is designed to address a broad interpretation of drawing issues. These may include drawing, painting, printmaking, and studies for sculpture, as well as abstract and observational works.
**Yearbook Design**  (Full Year)

*Staff positions will be assigned based on previous experience.*

Students will work on the conception, management, and production of the *Pinnacle*. The *Pinnacle* is produced each year by a collaborative staff whose primary goal is to produce an accurate, thorough, consistent, journalistically-sound, and well-designed record of the lives, emotions, and activities of the school year.

Students must be willing to devote time beyond the classroom including occasional after-school hours. Editor positions will be determined by the student’s previous experience, interest, performance, and work ethic.

The students will learn methods of pre-press design and supporting computer software. They will become proficient in using Adobe: InDesign, Photoshop, and Illustrator, as well as skills that will enhance students’ photography, layout design, and writing abilities.

Working as a group for a common goal is an integral part of the course. Students must be willing to share ideas and work within an administrative class framework. Staff will report to section editors; section editors will report to the editor-in-chief, and the editor-in-chief will report to the yearbook sponsor. To meet printing deadlines, organization and streamlining time management is a necessity.

The course goal is to produce a school-wide publication that records a year of life at PHS using contemporary trends in graphic design and photography.

**AP Art History**  (Full Year)

*Enrollment for qualified sophomores requires Art Department chair approval.*

This course is the study of Western art (major focus) and non-Western art (minor focus) within its historical and cultural context. Students will discover how art embodies values of a culture with reference to time and place of origin. Emphasis will be placed on students’ acquiring the ability to identify and describe major cultures, art movements, and art forms. Using the appropriate vocabulary, students will gain the ability to analyze the structure of artworks, interpret meaning, and evaluate aesthetic quality. This course will prepare students for the Advanced Placement Art History exam. Field trips to local museums and galleries will be a major resource. AP Art History may be taken for Social Studies credit. Please note, however, that students will not receive graduation credit in both Social Studies and Visual Art for this course; the student must choose one departmental designation or the other.
Language

All students are required to take three years of language in the upper school, at least two consecutive levels of the same language. Students are encouraged to continue the study of their language of choice for the duration of their high school career. The French, Latin, Mandarin Chinese, and Spanish sequences continue through the Advanced Placement level. Students may study more than one language at a time, and they may begin a new language sequence in any grade.

All language students must learn and perform the following skills in the target language: writing, spelling, reading, listening comprehension, and demonstrating an understanding of the target culture. In addition, French, Spanish, and Mandarin Chinese students must display speaking proficiency in the target language.

Independent Study Credit

Independent study proposals may be presented to the Language Department by students wanting to continue the study of a language past the Advanced Placement level. Proposals will be accepted following the guidelines of the school.

French - Level I (Full Year)

This is a beginning course for students with little or no previous study of French. Basic grammar and vocabulary will be taught; oral practice and communicative activities will be emphasized. Listening, reading, and writing skills will be developed throughout the year as well. Exposure to francophone cultures and customs is an integral part of the course.

French – Level II (Full Year)
Prerequisite: French I

This course continues the development of the four major communicative areas begun in Level I: listening comprehension, speaking, reading and writing. Students will further develop these skills in order to continue to communicate in meaningful and creative ways through written and oral work. The study of francophone practices, products and perspectives is an integral part of this course. Additional reading selections include Le Petit Nicolas.

French – Level III (Full Year)
Prerequisite: French II

The major objectives of this class are to develop the student’s confidence and ability to communicate in French both orally and in writing; to increase the student’s knowledge of the francophone culture; and to develop reading comprehension and writing to a higher level of proficiency. Reading selections include Le Petit Prince and short stories.
**French – Level IV** (Full Year)

*Prerequisite: French III and teacher recommendation*

In this course, the students will move beyond the intermediate level and further develop their oral and written expression, as well as their listening and reading skills. Grammar study and essay writing will reflect more complex structures, and students will begin to acquire thematic vocabulary organized around the six themes required for the AP exam. In-depth discussions on current events, values and ideas from francophone cultures will be used to develop oral fluency in French. A variety of literary readings and short films are also used to supplement the cultural aspects of this course and to improve reading and listening comprehension.

**French Conversation** (Full Year)

*Prerequisite: French III and teacher recommendation*

This is an elective class at the advanced level for students interested in continuing the study of French, but not intending to prepare for the Advanced Placement test. The course content will vary every year so that a student can enroll in the class more than once.

The focus of the course will be on practical and functional use of the language. Theme-based activities and oral projects will provide opportunities for students to use French to solve practical problems, communicate basic needs and feelings, discuss current events, and to describe concrete situations. Speaking is the primary mode of communication for this class, although listening, writing, and reading skills are also practiced and reinforced. Topics will be chosen to reflect the francophone values, ideas, customs and traditions, and to provoke cross-cultural comparisons. Field trips, guest speakers, films, cooking, and cultural presentations by the students will enrich the curriculum.

**AP French** (Full Year)

*Prerequisite: B in French IV and teacher recommendation*

This is an advanced level course specifically designed for students intending to take the French Language and Culture Advanced Placement Exam.

In this course, students will develop and improve their proficiency in the three modes of communication required for the AP exam, interpersonal, interpretive and presentational. Selections from authentic print, audio and audiovisual resources from around the francophone world will be used to address the cultural themes of the exam.

Reading selections will include a variety of materials, including a selection of literary works, magazines, and newspapers. Students will participate in in-depth discussion and analysis of selected texts. Essays and compositions will reflect increasing difficulty and advanced grammar, typical of the essay writing required for the AP Exam. Oral/aural exercises, spontaneous expression, conversation, grammar, and vocabulary review will also be central parts of the course. Students will take practice tests containing material directly applicable to the AP Exam throughout the year.

**Latin I** (Full Year)

Latin I introduces students to the language and cultural history of the Romans, whose civilization largely influenced our society and government. No prior knowledge of Latin is required for this course. Students will study Latin vocabulary and basic grammar with the goal of accurately translating Latin into English. Students
will also review English grammar and vocabulary through the study of words derived from Latin. Culture units will focus on life in the first century of the Roman Empire in Pompeii, Alexandria, Egypt, and Roman Britain. In addition, students will study Greco-Roman mythology, including the pantheon of gods and major heroes.

**Latin II**  
*(Full Year)*

Latin II builds on the foundations established in Latin I with the eventual goal of reading proficiency. Each chapter of the book presents new grammar concepts and vocabulary. Students will continue to study the Latin root words of English derivatives to build a strong vocabulary in both languages. History and culture units will focus on the Roman Empire, including provincial administration, the military, and political life in Rome. After successful completion of the introductory sequence (Latin I and II), students will be prepared to read “unabridged” Latin prose in Latin III.

**Latin III**  
*(Full Year)*

*Prerequisite: Latin II*

Students will read selections from Latin prose and poetry, focusing primarily on authors of the Late Republican and Early Imperial periods. For most of the year, the readings will be drawn from the final stages of *The Cambridge Latin Course, Unit IV*, and will offer an introduction to both poetry and prose through reading excerpts from Ovid, Catullus, Horace, Pliny the Younger, Cicero, and Vergil. Students will further their understanding through secondary reading sources, presentations, Internet activities, films, and individual projects. There will be frequent review of Latin grammar and sight translations to check comprehension, as well as continued work with Latin vocabulary and English derivatives.

**Latin IV**  
*(Full Year)*

*Prerequisite: Latin III and teacher recommendation*

Latin IV will focus on the culture and history of the late Republic and early Empire through poetry and prose. With history as a backdrop, students will read the works of various authors such as Plautus, Catullus, Horace, and Cicero. They will learn many of the conventions of Latin poetry, including poetic devices and the scansion of various lyric meters. Students will continue to perfect their Latin translation skills in preparation for AP Latin, by reviewing Latin grammar, sight reading in class, and by writing essays in English over passages of Latin literature.

**Latin V/AP**  
*(Full Year)*

*Prerequisite: Successful completion of Latin IV and teacher recommendation. For AP Latin, students also need a B in Latin IV.*

Students may take Latin V as an AP or non-AP option with the recommendation of their teacher. The focus of the class will be on how prose and poetry writers of the first century B.C. reflect the politics and culture of their time. Students will read sections from Vergil’s *Aeneid* in Latin as well as selected portions of Caesar’s *de Bello Gallico*. In addition, the class will study other portions of these author’s works in English and related topics such as the Roman military and the transition from Republic to Empire. Latin grammar, sight-reading, vocabulary, and English derivatives will continue to be essential components of the curriculum.

Those taking the class for AP credit will contract to complete additional work in preparation for the AP Exam. This will include extra readings in both Latin and English, practice writing analytical essays, and additional review sessions.
Mandarin Chinese – Level I  (Full Year)

This is a beginning course for students with little or no previous study of Chinese. Students will learn the strategy for constructing Chinese characters and will practice writing and pronunciation. By the end of this level, students are expected to produce brief conversations and read and write short paragraphs. Students will learn about Chinese people, popular cultural idioms, festivals and places. The study of current events in China as they relate to America is an integral part of the class.

Mandarin Chinese – Level II  (Full Year)
Prerequisite: Mandarin Chinese – Level I

This course continues the development of the four major communicative skills begun in Level I: listening, speaking, reading, and writing. Students will expand their vocabulary and be able to comprehend and participate in more extensive conversations, as well as read and write lengthier passages. In addition, the students will explore Chinese ancient dynasties and their significance in history, along with current events related to economic development and social issues in China.

Mandarin Chinese – Level III  (Full Year)
Prerequisite: Mandarin Chinese – Level II

In the third year of Chinese, students will continue to develop the skills acquired in Chinese II in the areas of speaking, writing, listening, and reading comprehension. Students will expand their vocabulary and be able to comprehend and participate in more extensive conversations. They will also read and write more complex sentences and passages, and be able to express themselves with more variety and fluency. In addition, the students will gain an appreciation of Chinese painting, opera, and architecture, as well as continue the study of current events.

Mandarin Chinese – Level IV  (Full Year)
Prerequisite: Mandarin Chinese – Level III and teacher recommendation

The objective of this course is to develop the students’ oral and written expression as well as their reading comprehension. The vocabulary and sentence structures introduced at this level are designed to complement and enhance what they have learned in previous years. The students will learn new vocabulary covering many themes (ex. Chinese recreational activities, geography, engineering projects). They will also explore Confucianism, Taoism, Buddhism, and the legendary myths which have profoundly influenced the culture and way of life in China and other Asian countries. The study of current events related to China and America is an essential part of the curriculum.

Mandarin Chinese – Level V/AP  (Full Year)
Prerequisite: Successful completion of Chinese IV and teacher recommendation. For AP Chinese, students also need a B in Chinese IV.

Students may take Chinese V as an AP or non-AP option with the recommendation of their teacher. The objective of this course is to prepare the students to communicate effectively and to overcome cultural barriers with confidence while fostering the students’ passion and enthusiasm for the Chinese language and culture. At this level, the students continue to expand their vocabulary and understanding of more complicated sentence structures. They will improve writing skills and speaking fluency while discussing topics in depth. They will
gain further knowledge about varied aspects of Chinese culture, for example, customs, consumerism, poetry, and ancient sayings. Supplementary materials will include chapter books, current events, advertising, blogs, and videos.

Those taking the class for AP credit will contract to complete additional work in preparation for the AP Exam. This will include extra reading, writing, speaking, and additional review sessions.

**Spanish – Level I**  
(Full Year)

The objective of this beginning course is to introduce the students to the basic principles of Spanish. The students will develop the following skills throughout the year: listening, speaking, reading, and writing. By the end of the year, they will be expected to comprehend and participate in brief dialogues and narratives, read and analyze simple narrative passages, as well as write dialogues and one-to two-paragraph assignments. In addition, the students will be introduced to the Hispanic culture in an effort to develop an appreciation of the different traditions and values of the Hispanic community.

**Spanish – Level II**  
(Full Year)  
*Prerequisite: Spanish I*

In the second year of Spanish, students will continue to develop the skills acquired in Spanish I in the areas of speaking, writing, listening, and reading comprehension. Students will be expected to listen to and comprehend a more lengthy conversation or narrative, to participate in more extensive conversations, to read and analyze more complex narrative passages, and to write longer assignments. Students will expand the vocabulary learned in Spanish I, as well as review and build on the grammatical concepts from the previous year. Hispanic culture will remain a topic of discussion in an effort to further the students’ understanding of the Hispanic lifestyle.

**Spanish – Level III**  
(Full Year)  
*Prerequisite: Spanish II*

Spanish III reviews and expands the vocabulary and grammar concepts acquired in Spanish II. Upon completion of the course, students will have been introduced to the majority of the tenses in the Spanish language, both in the indicative and subjunctive moods. Students will continue to practice the language skills of reading and listening comprehension, speaking and writing, but will do so at a more advanced level. They will also explore several aspects of the Hispanic culture more in depth and will read a short detective novel.

**Spanish – Level IV**  
(Full Year)  
*Prerequisite: Spanish III*

The objective of this course is to develop the students’ oral and written expression as well as their aural and reading comprehension beyond the intermediate level. The students’ text will introduce them to various themes, each of which is accompanied by relevant vocabulary, grammar, and authentic readings and short films. Each theme also includes a cultural component that focuses on the people, places of interest, history and traditions of Spanish-speaking countries. Upon completion of this course students may enroll in semester electives.
**Spanish- Level IV Accelerated**  (Full Year)  
*Prerequisite: Spanish III and teacher recommendation*

The objective of this course is to improve the students’ oral and written expression as well as their aural and reading comprehension beyond the intermediate level. The students’ text will introduce them to various themes, each of which is accompanied by relevant vocabulary, grammar, and authentic readings and short films. Each theme also includes a cultural component that focuses on the people, places of interest, history and traditions of Spanish-speaking countries. In this course, the material will be covered in more depth and all performance tasks will be more advanced than in the Spanish IV class. The students will be expected to analyze texts, engage in more extensive discussions, and write short analytical or comparative essays. Students who intend to take the AP Spanish Language and Culture class may enroll in AP Spanish immediately following completion of this class (a minimum grade requirement of a “B”). Students who choose not to take the AP Spanish class may enroll in Hispanic Literature Studies (a minimum grade requirement of a “B”) or semester electives.

**AP Spanish**  (Full Year)  
*Prerequisite: B in Spanish IV Accelerated and teacher recommendation*

The overall goal of this course is to prepare students to perform at a high level of proficiency in the skill areas of speaking, reading, writing, and listening. In preparation for the AP exam in May, students will participate in activities and complete sample tests that are directly modeled after the College Board's exam. Students will engage in an in-depth exploration of culture based on the themes they are required to prepare for the exam. Students will expand their vocabulary as they are exposed to a variety of authentic texts and literary works. Students are expected to use Spanish at all times while incorporating advanced grammar, which will be reviewed throughout the year.

**Spanish Electives**  (Fall and/or Spring)  
*Prerequisite: Spanish IV, Spanish IV Accelerated or Hispanic Literature Studies*

This is an elective class for students interested in continuing the study of Spanish beyond level IV. This course is available for students to take in lieu of, or after, AP Spanish. The course content will vary each semester so that a student can take the class more than once (maximum of four semesters).

Although many different regions and nations of the Spanish-speaking world share a common language, they each have their own cultures and traditions that make them distinctly different. The goal in this course is to familiarize students with cultural elements of these regions and nations and to develop a respect for the common Spanish heritage. Students will also review grammatical topics and vocabulary as needed in order to improve in all skill areas.

**Hispanic Literature Studies**  (Full Year; May Not Be Repeated)  
*Prerequisite: AP Spanish Language and Culture, or “B” in Spanish IV Accelerated, and teacher recommendation*

The objective of this course is to provide advanced Spanish students the opportunity to further develop their skills in the language through the study of Hispanic literature, which may include short stories, novels, plays, or poetry. Exposure to authentic literary works by Hispanic authors will benefit those students who enjoy literature and want to continue to improve their skills in Spanish. Vocabulary lists and cultural topics will be generated from the works studied, and grammar concepts will be reviewed as needed. This course will be taught entirely in Spanish.
Mathematics

The normal sequence of math courses for a Pembroke Hill Upper School student is Geometry, Algebra II, Pre-Calculus, and Calculus; the progression for students in the accelerated program is Algebra II Accelerated, Pre-Calculus Accelerated, AP Calculus, and AP Statistics. We also offer semester electives for students to enhance their math education such as Multivariable Calculus, Differential Equations, Number Theory, and Probability and Counting. Every student must be enrolled in, and pass, a year-long math course three of the four upper school years. It is highly recommended students complete four years of math.

Placement in sections is made individually each year after consideration of a student’s past performance in math, standardized test scores (for new students), attitudes and interests, level of mathematical maturity, and current teacher’s recommendation. It may happen that a student will move between the accelerated and non-accelerated levels over the course of four years. Skipping courses or substituting abbreviated summer work or on-line courses for an academic year course is not allowed.

Beginning in their freshman year, students are required to have a TI-83+ or TI-84+ graphing calculator for use in every math course. The graphing feature of this calculator enables students to gain an understanding of many mathematical concepts and will be used extensively in every course. In addition to the graphing calculator, iPads will be utilized for additional resources and interactive activities.

Transition to Geometry

This course reviews the fundamental principles of Algebra I and introduces students to the beginning concepts of Geometry. Topics covered include simplifying and evaluating expressions, relationships and functions, linear equations and inequalities, systems of linear equations, exponential and radical expressions and equations, rational expressions and equations, and beginning concepts of plane geometry.

Geometry

This course covers all the basic topics of plane geometry: lines, planes, angles and triangles, circles and spheres, areas of circles and sectors, polygonal regions and their areas, and coordinate geometry. An appreciation of the difference between congruence and similarity is stressed. In addition, students study the volumes of solids and are introduced to right triangle trigonometry. Topics are introduced through postulates, theorems, properties, and definitions. It is a major aim of the course that every student should be able to recognize and write logical proofs and, in the process, develop the skill of logical argument.

Geometry Accelerated

This course covers all the basic topics of plane geometry: line, plane, angles and triangles, circles and spheres, areas of circles and sectors, polygonal regions and their areas and coordinate geometry. An appreciation of the difference between congruence and similarity is stressed. In addition, students study the volumes of solids and are introduced to right triangle trigonometry. Topics are introduced through postulates, theorems, properties, and definitions. It is a major aim of the course that every student should be able to recognize and write logical proofs and, in the process, develop the skill of logical argument. In this course the concepts of geometry are covered in more depth than in the regular geometry class. Students in the accelerated geometry class apply geometric concepts but also analyze, synthesize, and evaluate their validity.
Algebra II

This is the second formalized course involving generalization and the development of abstract ideas. Topics covered include equations and inequalities, systems, polynomials, logarithms, exponents, radicals, rational expressions. Emphasis is placed on techniques of problem solving and the acquisition of mathematical reasoning skills, as well as connecting the verbal, numerical, analytical, and graphical representation of mathematical concepts.

Algebra II Accelerated

This is the second formalized course involving generalization and the development of abstract ideas. Topics covered include equations and inequalities, systems, polynomials, logarithms, exponents, radicals, rational expressions, conic sections, trigonometry, probability, statistics, and mathematical modeling. Emphasis is placed on techniques of problem solving, the acquisition of mathematical reasoning skills, and application of concepts to real world problems, as well as connecting the verbal, numerical, analytical, and graphical representation of mathematical concepts.

Pre-Calculus

This course is designed to prepare students for Calculus. During the first semester, emphasis is placed on reviewing Algebra II skills, and the mastery of trigonometry. Most of second semester is devoted to rational, exponential, and logarithmic functions, conic sections, sequences, series, and probability. After completing this course, students should have all the pre-calculus topics mastered and be well prepared to begin the study of Calculus.

Pre-Calculus Accelerated

This is the first course in the two-year Advanced Placement Calculus sequence. Emphasis is placed on reviewing functions, equations, and inequalities from algebra: polynomial, radical, rational, exponential, and logarithmic. Following the review, topics include trigonometry, vectors, partial fractions, sequences, series, probability, conics, parametric and polar coordinates, and equations. This course culminates in a brief introduction to calculus including differentiation and integration.

Calculus

This is a first course in Calculus as it applies to business and economics. Topics covered include differentiation and integration of algebraic, exponential, and logarithmic functions. Emphasis will be placed on measuring rates of change and accumulation. An interpretation of solutions given a particular context is stressed.

AP Calculus AB

This is the second course in the two-year Advanced Placement Calculus sequence and is thus a continuation of the Pre-Calculus Accelerated course. The Advanced Placement course outline of topics is covered. The course includes a review of limits as well as differentiation and integration of elementary functions. The concepts of slope and area are introduced as the motivation for derivatives and integrals. A clear understanding of The Fundamental Theorem of Calculus is essential. New functions such as the logarithmic, exponential, and inverse trigonometric are introduced. Students are familiar with some of these functions but
will learn their application to derivatives and anti-derivatives. Students must be able to do their evaluations with and without the use of a calculator.

**AP Calculus BC**

This course covers all of the topics from the Calculus AB outline plus some additional integration techniques, sequences, series, parametric and polar functions, and vector-valued functions, thus preparing students for the BC Calculus Advanced Placement Exam. The content of Calculus BC is designed to qualify the student for placement one college semester beyond that granted for Calculus AB. Students must be able to perform their evaluations with and without the use of a calculator.

**AP Statistics**

Statistics is the science of collecting, organizing, and interpreting numerical facts. This course is divided into four major themes: exploratory analysis, planning a study, probability, and statistical inference. Students electing this course take the Advanced Placement Exam in the spring. Prerequisite: Pre-Calculus and at least a B in the student’s last math class.

**Mathematics Semester Electives**

**Introduction to Probability and Counting** (Spring)

*Prerequisite is successful completion of Algebra I and/or instructor recommendation*

This course focuses on problem solving to explore the mathematics of basic probability and counting. Problem sets will be completed by students each week over different topics of probability and counting. Interesting facts and powerful problem solving approaches will be presented throughout the course to aid the student. Topics may include, but are not limited to basic counting techniques, using corrections to counting techniques with restrictions, combinations, permutations, basic probability techniques, geometric probability, Pascal’s triangle, expected value, and the binomial theorem. Completion of the course will help prepare students for mathematical contests such as AMC and Math League, as well as standardized tests like the SAT and ACT. Students enrolling in this course should have mastery of basic algebra.

**Introduction to Number Theory:** (Fall)

*Prerequisite is successful completion of Algebra I and/or instructor recommendation*

This course covers fundamental principles of number theory, including primes and composites, divisors and multiples, divisibility, remainders, modular arithmetic, and number bases. Topics will include Integers, Primes & Composites; Divisibility Relationships; Prime Factorization and Relationships; Counting Divisors; Divisor Counts and Products, Special Numbers, Units Digits; Base Numbers; Base Number Arithmetic; Introduction to Diophantine Equations; Repeating Decimals; Modular Arithmetic -- Residues, Congruence, Addition, Subtraction, Multiplication and Divisibility; Linear Congruence; Systems of Linear Congruence; and various Challenging Problems in Number Theory. This course is appropriate for students who have mastered basic algebra through solving linear equations and manipulating multi-variable expressions. Students who are already proficient with modular arithmetic and basic Diophantine equations do not need this course.
Differential Equations: (Spring)
(Prerequisite is successful completion of Multivariable Calculus and/or instructor recommendation)

This course serves as an introduction to ordinary differential equations of first order and higher order linear equations. Topics are applicable to many physical sciences and engineering and may include, but are not limited to analytical methods of solving Ordinary Differential Equations of first and higher orders, development of transform methods (Laplace) to solve differential equations and to study their solutions, the modeling of dynamic processes as differential equations: mixture problems, mechanical systems, RLC circuits, population growth, and predator-prey populations, use of the symbolic computational system like Mathematica, direction fields (flows), phase portraits, and an introduction to qualitative differential equations, development of quantitative methods to numerically approximate the solutions to differential equations including Runge-Kutta methods and multi-step approximations, and other topics such as systems of differential equations, as time permits.

Multivariable Calculus III: (Fall)
(Prerequisite is successful completion of Calculus BC and/or instructor recommendation)

In this course the student will extend the ideas of calculus in two and three dimensions. The concepts of 1-variable calculus arise in studying the motion of a particle along a line. For a particle moving through space, not just along a line, the position, velocity, and acceleration at each moment are described by vectors, not just by single real numbers. Force and angular velocity are also modeled mathematically as vectors. Students begin by studying the algebra of vectors (linear algebra), which allows us to describe the relationships between vector quantities in physics and also forms the basis of analytic geometry in 3-dimensional space and learn how to generalize the concepts of derivative and integral to vector-valued functions. The graph of a function of 2 variables is a surface in space. At a point of such a graph, one has a tangent plane, not just a tangent line. Students will not only learn how to describe the tangent plane in terms of ideas of calculus, but also learn how the concepts of derivative and integral generalize to functions of several variables. In the last part of the course, students learn the 2-dimensional version of the Fundamental Theorem of Calculus, Green’s Theorem. This is the mathematics behind the physical notions of work and potential energy, and is a big step toward understanding electric and magnetic fields.
## Mathematics Curriculum for the Middle and Upper School

Some typical programs

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<th>7th</th>
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<th>10th</th>
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<tr>
<td>Algebra I-7</td>
<td>Algebra I-8</td>
<td>Geometry or Geometry Acc.</td>
<td>Algebra II</td>
<td>Pre-Calculus</td>
<td>Calculus</td>
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<td>Algebra II Acc.</td>
<td>Pre-Calculus Acc.</td>
<td>AP Calculus (AB/BC)</td>
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<td>or Semester Electives</td>
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</table>

1. It is school policy that every Pembroke Hill student be enrolled in a year-long math course through the junior year. Successful completion of Algebra II is required for graduation. Workshops, summer courses, or online courses cannot be substituted for a year-long course offered in the Upper School.

2. If a student receives an advanced placement recommendation from the Middle School Math Department or from the Department Chair in the Upper School (for an incoming high school student), the student may enroll in an advanced sequence of courses.

3. In addition to the traditional year-long math courses, students may enroll in semester elective courses.
Physical Education

The Physical Education Department will endeavor to give students appropriate knowledge and ability in the areas of lifetime fitness, exercise, and nutrition and stress management. Students will be assisted in developing lifelong fitness programs, and they will be encouraged to self-evaluate their fitness programs and modify them continuously as fitness needs change.

Graduation Requirement

All students will be required to earn 1.5 credits of Physical Education for graduation. The credit will be available through the Concepts of Physical Fitness course for .75 credits which is required for all freshmen. The remaining .75 credits needed for graduation may be obtained during a student’s 10-12 grade years. The students may choose the Lifetime Personal Fitness course, PHS Athletics or apply for Independent Study in order to complete the remaining .75 credit of physical education required for graduation. All Physical Education requirements should try to be completed by the end of the junior year. Students that do not participate in athletics their freshmen year will be required to take the Lifetime Personal Fitness course their sophomore year.

Concepts of Physical Fitness Course

All freshmen will be required to take the Concepts of Physical Fitness course. Students will earn .75 credits upon completion of the Concepts of Physical Fitness course.

Course Objective: This course will provide the knowledge and foundation necessary to establish a personal lifetime fitness program. It will be based on seminar sessions and physical activity to ensure a firm foundation for developing lifetime fitness.

Expectations:
Students participating in a PHS-sponsored sport or an approved Independent Study will be responsible for:

1. Completing the designated work during scheduled seminar times.
2. Attending lectures during the scheduled seminar times.
3. Attending sports practice each week.
4. Writing a personal workout program.

Students not participating in a PHS-sponsored sport or approved Independent Study are responsible for:

1. Completing the designated work during scheduled seminar times.
2. Attending lectures during the scheduled seminar times.
3. Two half-hour workout sessions per week in the PHS facility using a heart rate monitor to ensure students are working out in their optimal heart rate zone.
4. Writing a personal workout program.

Lifetime Personal Fitness Course

The remaining .75 credits (.50 per semester) of the physical education credit may come in the form of one of the following: PHS athletics, Independent Study, or the Lifetime Personal Fitness course through the PHS Physical Education Department. All sophomores not participating in athletics will be required to enroll in the Lifetime Personal Fitness course.
Course Objective: This course will build upon and utilize the information taught in the Concepts of Physical Fitness course. Students will develop and use their own personal fitness programs developed in the Concepts of Physical Fitness course. They will monitor and assess their progress for strength, cardio-respiratory endurance, and over-all fitness level. They will then revise their personal fitness program as needed to reach their potential for optimal health.

Expectations:
1. Log three half-hour workout sessions per week in the PHS facility using a heart rate monitor to ensure students are working out in their optimal heart rate zone.
2. Utilize their personal fitness program designed in the Concepts of Physical Fitness course.
3. Write a research paper on their lifetime personal fitness program.

Independent Study

Requirements for Independent Study:
1. Selected activity is unavailable within the physical education/athletic department curriculum.
2. Selected activity must be a minimum of four (4) days a week excluding Saturdays and Sundays.
3. Selected activity must be a minimum of one (1) hour of participation each of the four (4) days.
4. A certified instructor in the specified activity must give instruction for the selected activity. A letter of recommendation must be attached to the application.

Requirements for Elite Independent Study:
1. Selected activity should be a minimum of five (5) days a week excluding Saturdays and Sundays.
2. Selected activity needs to be a minimum of two (2) hours of participation each of the five (5) days.
3. Instruction for the selected activity must be given by a certified instructor in that activity and proof of the certification of the instructor MUST BE ATTACHED, in order for the application to be considered.
4. Athlete must be considered “Elite” status and provide proof of “Elite” status (national competition, national travel, national ranking, etc…). A letter of recommendation must be attached to the application.

Applications for Independent Study are due a minimum of ONE WEEK before the beginning of EACH Semester in which credit is being requested.
ATHLETIC PROGRAM

General Information

Practice Sessions
Practice sessions are Monday through Friday, some Saturdays and a few Sundays, but there will be no required practices on Sundays. Other than weekend and non-school days, practices are usually held immediately after school and last 2 to 2½ hours.

Seasons

Fall
Practices begin around the second week in August and may continue into the second week of November depending on state playoffs.

<table>
<thead>
<tr>
<th>Boys</th>
<th>Girls</th>
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<tbody>
<tr>
<td>Cross Country</td>
<td>Cheerleading</td>
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<tr>
<td>Football</td>
<td>Cross Country</td>
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<td>Soccer</td>
<td>Field Hockey</td>
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<td>Swimming and Diving</td>
<td>Tennis</td>
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<td>Golf</td>
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<td>Volleyball</td>
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Winter
Practices begin around the last week of October and may continue into the second week of March depending upon state playoffs.

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<th>Boys</th>
<th>Girls</th>
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<tr>
<td>Basketball</td>
<td>Basketball</td>
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<td>Wrestling</td>
<td>Cheerleading</td>
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<td></td>
<td>Swimming and Diving</td>
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<td>Dance</td>
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Spring
Practices begin around the third week of February and may continue until the first week of June depending on state playoffs.

<table>
<thead>
<tr>
<th>Boys</th>
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<td>Baseball</td>
<td>Soccer</td>
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<td>Golf</td>
<td>Track &amp; Field</td>
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<td>Lacrosse</td>
<td>Lacrosse</td>
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<td>Tennis</td>
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<td>Track &amp; Field</td>
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Science

Students are required to take Biology in ninth grade and Chemistry in 10th. The third unit may be taken in junior or senior year. Courses that may be elected to fulfill the minimum three-unit requirement include Physics, AP Physics 1, AP Biology, AP Chemistry, AP Environmental Science, and semester science electives. Though three years of science is the minimum requirement, it is recommended that students take a science course each year. Students may double in science courses in the junior and/or senior year. Laboratory work is an integral part of every course, wherein students gain extensive hands-on experience and work in groups to reinforce and expand scientific concepts. Students considering a competitive college or science-based career, such as medicine or engineering, should take Biology, Chemistry, Physics and at least one Advanced Placement science course in the upper school as thorough preparation for the college curriculum. A suggested science course sequence follows these course descriptions.

Biology (Full Year)
Required Course, 9th grade

The Biology course is designed to give students a comprehensive introduction to the study of life sciences. Topics included are biochemistry, cell structure and function, genetics, evolution, anatomy and physiology, and ecology. Frequent classroom activities and laboratory work reinforces conceptual understanding and develops analytical skills. Students will be evaluated on homework, laboratory reports, tests, class participation and various papers and projects.

Biology Accelerated (Full Year)
Required Course, 9th grade

The Accelerated Biology course covers the similar general topics as Biology but examines each area at a greater level of depth and detail, and proceeds at a faster pace. This course is designed to give students a comprehensive introduction to the study of life sciences. Topics included are biochemistry, cell structure and function, genetics, evolution, anatomy and physiology, and ecology. Frequent classroom activities and laboratory work reinforces conceptual understanding and develop analytical skills. Students will be evaluated on homework, laboratory reports, tests, class participation, and various papers and projects. Accelerated Biology is the appropriate course for students who have shown a demonstrated interest and ability in science coursework, have taken a science course with a laboratory component at the middle school level, and have strong math and independent reading abilities. Students should also possess well-developed study habits and organizational skills.

Chemistry (Full Year)
Required Course, 10th grade
Prerequisites: Biology

Chemistry serves as a general introduction to chemistry and a solid foundation for more advanced work in science. A balance is sought between descriptive material, designed to stimulate interest and appreciation for the subject, and more quantitative (computational) material, which stresses the mastery of key concepts. Chemistry will cover a curriculum similar to Chemistry Accelerated, differing mostly in pace and mathematical complexity. Extensive student laboratory work is designed to reinforce concepts and develop the student’s skills in laboratory analysis and use of appropriate materials.
Chemistry Accelerated  (Full Year)

*Required Course, 10th grade*

*Prerequisites: Biology and departmental recommendation*

Chemistry Accelerated is an introductory chemistry course, which offers a more extensive curriculum at a faster pace than Chemistry. This course will emphasize problem-solving, quantitative understanding of natural phenomena, and nuanced conceptual understanding of abstract topics. Frequent demonstrations and labs will be used to reinforce concepts and develop laboratory skills for future scientific learning. Students who successfully complete Chemistry Accelerated should be well prepared to enroll in AP Chemistry in future years.

Physics  (Full Year)

*Prerequisites: Algebra II and Chemistry*

The introductory algebra-based physics course is intended for students seeking a basic, broad-based background in physics with particular emphasis placed on qualitative reasoning skills, the ability to conceptualize a variety of natural phenomena. This hands-on course also utilizes frequent demonstrations and laboratories to develop the quantitative skills in measurement, graphical analysis, and problem solving necessary to prepare students for a college level course or for advancement to AP Physics. This course is designed to provide a survey of topics in the areas of mechanics, electricity and magnetism, waves and sound, optics, and a brief introduction to modern physics. Students who successfully complete Physics may opt to enroll in AP Physics upon completion of the course.

AP Physics 1  (Full Year)

*Prerequisites: Algebra II and Chemistry; 11th or 12th grade only*

*Students must have at least a B+ average in BOTH Chemistry and the math course taken the year prior, or written permission from the course teacher or department chair. Students enrolled in Physics in 11th grade may take this course in 12th grade for AP credit.*

This introductory algebra-based physics course is designed to provide students with deep conceptual understanding of the physics typical of first semester college courses. Topics in the course include Newtonian mechanics (including rotational motion); work, energy, and power; mechanical waves and sound; and introductory, simple circuits. By College Board requirement, 25% of class time will be spent doing work related to laboratory investigations, with the emphasis on student-designed inquiry. Students are required to take the AP Physics 1 exam at the end of the course.

AP Biology  (Full Year)

*Prerequisite: Biology and Chemistry completed with at least a “B+” average, or permission from course instructor*

AP Biology is designed to be the equivalent of a first year college biology course. Its goal is to provide students with the conceptual framework, factual knowledge, and analytical skills necessary to deal critically with the rapidly changing science of biology. Laboratory experiments are integrated wherever possible in support of the subject areas which include biochemistry, cell biology, molecular genetics and biotechnology, evolution, taxonomy, human anatomy and physiology, plant anatomy and physiology, ecology, and animal behavior. The course includes review in the spring in preparation for the AP Biology exam.
AP Chemistry (Full Year)

Prerequisites: Algebra II, B+ or above, and one year of Chemistry, B+ or above, or permission from course instructor

AP Chemistry is a course for those who wish to investigate major concepts in chemistry more thoroughly in preparation for a scientifically-based career. Class discussion and problem-solving, using a college-level text as the focus of effort, are the prime activities in the class. Laboratory work, as recommended by Advanced Placement guidelines, is incorporated as appropriate. At the end of the course, all students will take the AP Exam, and, if successful, may test out of the first year of chemistry at many colleges.

AP Environmental Science (Full Year)
Prerequisites: Biology and Chemistry with at least a B+ average, or permission from course instructor

AP Environmental science examines the relationships between living things and their environments and prepares students for the AP Environmental Science exam. Students will learn through a wide variety of media, including textbook, labs (both indoor and outdoor), videos, online activities and projects. Some environmental service will be required. Topics include sustainability; biomes and climate regions of the earth; basic earth science, weather and climate; biogeochemical cycles; ecology; soil science; endangered species and loss of biodiversity; growth and control of populations; water use and water pollution; air pollution; climate change and ozone depletion; waste disposal and environmental toxicity; and energy resources.

AP Physics C Mechanics and Electricity & Magnetism (Full Year)
Prerequisites: AP Physics I and Calculus

Students must have at least a B+ average in AP Physics I, or written permission from the course teacher. Prior enrollment or current enrollment in BC Calculus is highly recommended.

This advanced, calculus-based physics course is provided as an option for students who plan to go into college physics or engineering or who want the challenge of the application of differential and integral calculus to physics problem solving. During AP Physics C Mechanics in first semester, students will study concepts in kinematics; Newton’s laws of motion, work, energy and power; systems of angular and linear momentum; circular motion and rotation; oscillations; and gravitation. During AP Physics C Electricity and Magnetism in the second semester, students will explore concepts in electrostatics, electric circuits, conductors, capacitors, dielectrics, magnetic fields, and electromagnetism. By College Board requirement, 20% of class time will be spent doing work related to laboratory investigations, with the emphasis on student-designed inquiry. Students are required to take both the AP Physics C Mechanics and the AP Physics C Electricity & Magnetism exams at the end of the course.

Semester Electives:

Human Anatomy and Physiology (Fall)
Prerequisite: Biology

The Anatomy and Physiology Fall semester course examines the basic biological concepts of structure and function of the human body, with a survey of several body systems. Lab work will include a significant amount of dissection, with an intensive multi-week dissection of one selected mammal model. After an introductory unit, students will fully investigate each of these body systems through lab work, textbook and article reading, collaborative projects, videos, and classroom discussions. This course will also include the study of diseases and disorders and strategies for maintaining and improving health.
Science and Society  (Fall)

Prerequisite: Biology and Chemistry

The science and society course will examine some of the greatest scientific challenges of the 21st century, both at a local and global scale. Topics investigated may include, but are not limited to climate change, population dynamics (humans and wildlife), biodiversity loss, energy and environment, environmental justice, infectious diseases, and the rising obesity epidemic. This course may include a project-based learning component. Learning objectives and assessment will include utilization of scientific content and process skills, with a focus on critical thinking, problem solving, and application of knowledge.

Neurobiology and Cognition  (Spring)

Prerequisite: Biology and Chemistry

One of the most challenging and interesting problems in biology is understanding the brain: how we think, feel, remember, and learn. Neurobiology is the study of the nervous system and its constitutive parts – nerve cells and neural circuits – and the way in which these structures mediate behavior. Students will learn fundamental information about the cellular biology and properties of neurons and the brain. Students will also be introduced to advances in other fields within cognitive sciences, such as cognitive psychology, philosophy, and artificial intelligence, which contribute to our understanding of mental processes such as language and memory.

Human Anatomy and Physiology  (Spring)

Prerequisite: Biology

The Anatomy and Physiology spring semester course will focus on the structure and function of the human body systems that are not covered during the fall semester. This laboratory based class will include several anatomical organ dissections, as well as various physiology labs. After a brief introductory unit, students will fully investigate each of these body systems through lab work, textbook reading, research projects, videos, and classroom discussions. The course will also include the study of diseases and disorders of each system and strategies for maintaining and improving health. Students are not required to take the fall semester course as a prerequisite.

Independent Laboratory Research  (Fall or Spring)

Prerequisite: Biology and Chemistry, completion of required science credits, approval of science faculty review committee in semester prior to enrollment, and administrative approval

This class is in place for those students interested in continuing a previous research project for credit. It is possible for a student to earn a half credit in science by fulfilling the following requirements. However, this one-half unit may not count toward the first three credits for graduation. To be eligible, a student must have initiated significant research on the topic prior to submission of the proposal to the Science Chair. The final approval for credit includes consideration of time spent per week (based on the student log and notebook), quality of the research project, submission of a final paper, and entry of the project into at least one approved competition.
Recommended Science Course Sequence

9th grade:
Biology or Biology Accelerated

10th grade:
Chemistry or Chemistry Accelerated

11th grade (students may take more than one):
Physics
AP Physics 1
AP Chemistry
AP Biology
AP Environmental Science
Semester Science Electives

12th grade (students may take more than one):
Physics
AP Physics 1
AP Physics C
AP Chemistry
AP Biology
AP Environmental Science
Semester Science Electives
Social Studies

Every student is required to complete a sequence of three full-year courses. The sequence consists of 1) “The World to 1500,” 2) “The World Since 1500,” and 3) a survey of United States history as part of the American Civilization program.

Advanced Placement options exist in eleventh-grade American history, and in four senior electives: psychology, economics, American government, and art history.

The World to 1500 (Full Year)

“The World to 1500” surveys the development of the world’s major civilizations up to 1500 C.E. Beginning with the ancient river valley civilizations, we move on to explore the histories of China, India, Meso-America, Europe, and select African cultures. Different instructors may emphasize various aspects of a culture or its history, but our common commitment is to the students’ learning to appreciate humanity’s rich diversity of social customs and forms of belief (Islam, Hindu, etc.) The course will conclude with an analysis of the emerging world economy of the sixteenth century.

The World Since 1500 (Full Year)

Beginning where “The World to 1500” ends, this course focuses on the developing interactions among different human societies. Spotlighting the increasingly intense international contact and exchanges among Asian, European, African, Middle Eastern, and American peoples, the course will look specifically at issues of economic growth and expansion, environmental challenge, technological change, and the organizational development of various political systems. By the end of the course, students should have a good understanding of how the world has changed and will continue to be affected by cultural, political, and economic interactions.

American Civilization (History) (Full Year)

This college-level course is a study of American history from colonial times to the 1990s. The class covers political, economic, social, and diplomatic history. The course is required of all juniors, who concurrently enroll in American Civilization English. Students wishing to take the AP exam and receive AP designation for the course must sign a contract and attend outside review sessions. A summer reading book will be assigned for this class.

Twelfth Grade Electives

AP Economics (Full Year)

Prerequisite: Grades of B or higher in both math and history during the junior year

Designed for students who want to understand the economic workings of our society and of the individual business firm, this rigorous course also prepares students for two spring AP exams: Microeconomics and Macroeconomics. The fall semester will focus upon micro topics including supply and demand, price determination, consumer theory, price elasticity, marginal costs and revenues, profit maximizing issues, and forms of industry competition. The spring semester will cover introductory topics including scarcity and opportunity costs, as well as macro topics such as aggregate supply and demand, national output and income, inflation and unemployment, money and central banking, fiscal and monetary policy, and trade and exchange rate issues.
AP Psychology  (Full Year)

Prerequisite: B+ or higher average in previous science courses

What could be more interesting than trying to answer some of the questions about why people act the way they do? Can we predict, understand, possibly even control behavior? As we try to answer these questions, as well as others, our focus will be on the systematic and scientific study of the behavior and mental processes of human beings and other animals. Students will be exposed to the psychological facts, principles and phenomena associated with the major subfields of psychology as well as learn about the methods psychologists use in their science and practice. Additional topics will include history of psychology, sensation and perception, states of consciousness, cognition, motivation and emotion, testing, abnormal behavior, psychological disorders, and socio-cultural influences on behavior.

AP American Government  (Full Year)

Prerequisite: A year-end average of B+ or higher in US History

The fall semester provides an introduction to the American political process and to the federal government. Areas of emphasis include: public opinion, interest groups, political parties, the Congress, the Presidency, and the Supreme Court. Contemporary policy issues will also be examined. The second semester will focus on public policy, foreign and domestic, as well as campaigns, elections, the media, civil rights, and civil liberties. Students who wish to take AP Government must have taken the AP US History exam and earned a grade of B+ or higher for the year. Students who do not meet the requirement(or who did not receive a score of 3 or higher on the AP US History Exam) may request placement in the course with the approval of their US History instructor and the AP Government instructor.

AP Art History  (Full Year)

Enrollment for qualified sophomores and juniors requires Department Chair approval.

This course is the study of Western art (major focus) and non-Western art (minor focus) within its historical and cultural context. Students will discover how art embodies values of a culture with reference to time and place of origin. Emphasis will be placed on students’ acquiring the ability to identify and describe major cultures, art movements, and art forms. Using the appropriate vocabulary, students will gain the ability to analyze the structure of artworks, interpret meaning, and evaluate aesthetic quality. This course will prepare students for the Advanced Placement Art History exam. Local museums and galleries will be a major resource, and field trips are frequent. AP Art History may be taken to satisfy the Visual Art graduation requirement (i.e., it can replace the introductory Visual Art course), unless the student wishes to take other studio-based art classes. Alternatively, AP Art History may be taken for Social Studies credit. Please note, however, that students will not receive graduation credit in both Social Studies and Visual Art for this course; the student must choose one departmental designation or the other.
2018-2019 Student Course Catalog

GOA students are modern learners.

The mission of Global Online Academy is to reimagine learning to enable students to thrive in a globally networked society. GOA provides a positive, interactive, and academically rigorous environment for students to learn. We offer courses that connect students to topics they care about, and we offer a network that connects those students to peers as passionate as they are.

As GOA learners, our students also develop a specific set of skills, skills that might not be exercised as often in a bricks and mortar environment. Based on our research, student surveys, and feedback from our faculty, we have identified six core competencies that students develop in practical, hands-on ways, no matter which GOA course they take:

1. Collaborate with peers who are not sitting with them on campus.
2. Communicate and empathize with people living in areas of the world that are culturally different from their own.
3. Leverage their curiosity to curate and create content that is relevant to real-world issues.
4. Reflect on and take responsibility for their learning and that of others in an open forum.
5. Organize their time and tasks to become independent learners.
6. Interpret assignments and express themselves using a variety of learning tools.

To build these skills, GOA courses are...

- **Globally connected**: Even though our courses are online, students get to know their teacher and classmates. Each of our classes has no more than 20 students from many different schools, led by an expert teacher from one of our member schools. Students log in multiple times a week to engage in discussions, collaborate on projects, and share ideas. They learn how to use technology to build relationships.

- **Challenging**: GOA courses are designed to be as rigorous as any course at a home school. Students spend 5-7 hours a week their courses. GOA courses are mostly asynchronous: students do not show up on certain days at certain times. Instead, teachers publish a calendar of activities, and within that framework, students work on their own schedules, gaining critical independent learning skills along the way.

- **Relevant**: We want students to pursue their passions. Our courses offer practical, hands-on experience in how these ideas can be applied to the world outside of school. Students have voice and choice in the work they do and the ideas they explore.
# Department Designations

Unless otherwise noted, courses are one semester long. Some courses are cross-listed and will appear in multiple departments.

## Art, Media, and Design

<table>
<thead>
<tr>
<th>Department</th>
<th>Course 1</th>
<th>Course 2</th>
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</thead>
<tbody>
<tr>
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<td>Digital Photography</td>
<td>Music Theory and Digital Composition</td>
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<td>Creative Nonfiction</td>
<td>Filmmaking</td>
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</tr>
<tr>
<td>Computer Science II: Game Design and Development</td>
<td>Graphic Design</td>
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</tbody>
</table>

## GOA Learning Studios

<table>
<thead>
<tr>
<th>Department</th>
<th>Course 1</th>
<th>Course 2</th>
<th>Course 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advocacy</td>
<td>Entrepreneurship in a Global Context</td>
<td>Social Psychology</td>
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<tr>
<td>Climate Change and Global Inequality</td>
<td>Positive Psychology</td>
<td></td>
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</tr>
<tr>
<td>Advanced Topics in Economics</td>
<td>Entrepreneurial Leadership (Online continuation of summer residential program)</td>
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## Mathematics and Technology

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<thead>
<tr>
<th>Department</th>
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</thead>
<tbody>
<tr>
<td>Computer Science I: Computational Thinking</td>
<td>Computer Science II: Java</td>
<td>Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>Computer Science II: Analyzing Data with Python</td>
<td>Game Theory</td>
<td>Multivariable Calculus (yearlong)</td>
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</tr>
<tr>
<td>Computer Science II: Game Design and Development</td>
<td>iOS App Design</td>
<td>Number Theory</td>
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**Science and Health**

<table>
<thead>
<tr>
<th>Abnormal Psychology</th>
<th>Introduction to Psychology</th>
<th>Neuropsychology</th>
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</thead>
<tbody>
<tr>
<td>Bioethics</td>
<td>Medical Problem Solving I</td>
<td>Positive Psychology</td>
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<tr>
<td>Global Health</td>
<td>Medical Problem Solving II</td>
<td>Social Psychology</td>
</tr>
</tbody>
</table>

**Social Sciences**

<table>
<thead>
<tr>
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<td>Prisons and the Criminal Law</td>
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<td>Comparative Politics</td>
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</tbody>
</table>

**World Languages (yearlong)**

<table>
<thead>
<tr>
<th>Arabic Language Through Culture (Levels I-III)</th>
<th>Japanese Language Through Culture I</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Japanese Language Through Culture II</td>
</tr>
</tbody>
</table>

Upper School Program of Studies 2018-2019 47
Courses by Term, 2018-2019

Some courses are offered in multiple terms and appear more than once.

### Summer: June 18-August 3, 2018

*Summer@GOA offers some of our most popular courses in an intensive 7-week format.*

<table>
<thead>
<tr>
<th>Course</th>
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### Semester 1: September 5-December 21, 2018

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<td>Digital Photography</td>
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</table>
### Semester 2: January 16-May 3, 2019

<table>
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<tbody>
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<td>9/11 in a Global Context</td>
<td>Computer Science II: Game Design and Development</td>
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### Yearlong (Semesters 1 and 2)

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<td>Arabic Language Through Culture (Levels I-III)</td>
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<td>Multivariable Calculus</td>
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</table>
# Academic Calendar 2018-2019

## Semester 1

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 13, 2018</td>
<td>Semester 1 and Yearlong Course welcome pages published for students</td>
</tr>
<tr>
<td>August 20 - September 4</td>
<td>Synchronous teacher/student pre-course conversations. These are important (ungraded) initial conversations between teachers and students.</td>
</tr>
<tr>
<td>September 5</td>
<td>Wednesday, September 5: Semester 1 and Yearlong Courses Open</td>
</tr>
<tr>
<td>September 17 (5pmPST)</td>
<td>Last day to ADD a GOA course (and drop with no financial penalty)</td>
</tr>
<tr>
<td>September 24 (5pmPST)</td>
<td>Last day to DROP a GOA course</td>
</tr>
<tr>
<td>October 26</td>
<td>End of Grading Period 1</td>
</tr>
<tr>
<td><strong>Semester Break</strong></td>
<td>Due to the diversity of GOA schools’ calendars, teachers in Semester 1 will be able to choose the week during which their class will be on break. They will make this choice the first week of the semester based on the schedules of the students on their roster and communicate that to students, Site Directors, and GOA.</td>
</tr>
<tr>
<td>November 9</td>
<td>Grade Reports distributed</td>
</tr>
<tr>
<td><strong>December 21, 2018:</strong></td>
<td>Semester 1 Ends (end of Grading Period 2)</td>
</tr>
<tr>
<td>January 11, 2019</td>
<td>Semester 1 Grade Reports distributed</td>
</tr>
</tbody>
</table>
### Semester 2

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 17, 2018</td>
<td>Semester 2 course welcome pages published for students</td>
</tr>
<tr>
<td>January 7-16, 2019</td>
<td>Synchronous teacher-student conversations for Semester 2 courses. These are important (ungraded) initial conversations between teachers and students.</td>
</tr>
</tbody>
</table>

**Wednesday, January 16: Semester 2 Courses Open (yearlong courses resume)**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 28</td>
<td>Last day to ADD a Semester 2 GOA Course (and drop with no financial penalty)</td>
</tr>
<tr>
<td>Feb 4</td>
<td>Last day to DROP a Semester 2 GOA Course</td>
</tr>
<tr>
<td>March 8</td>
<td>End of Grading Periods 1 (semester) and 3 (yearlong)</td>
</tr>
</tbody>
</table>

**Semester Break**

Due to the diversity of GOA schools' calendars, teachers in Semester 2 will be able to choose the week during which their class will be on break. They will make this choice the first week of the semester based on the schedules of the students on their roster and communicate that to students, Site Directors, and GOA.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 22</td>
<td>Grade Reports distributed</td>
</tr>
</tbody>
</table>

**Friday, May 3: Semester 2 Ends (end of Grading Periods 2 (semester) and 4 (yearlong))**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 17</td>
<td>Grade Reports distributed</td>
</tr>
</tbody>
</table>
University of California and NCAA Course Approvals

**University of California**
GOA’s entire course catalog is UC-approved through 2017-2018 and will be submitted for renewal in February, 2018. You can view our current A-G course list by visiting [hs-articulation.ucop.edu](http://hs-articulation.ucop.edu) and searching for “Global Online Academy.”

**NCAA**
The below GOA courses are NCAA-approved for 2018-2019.

<table>
<thead>
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<th>Linear Algebra</th>
<th>Poetry Writing</th>
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<td>Comparative Politics</td>
<td>Introduction to Psychology</td>
<td>Multivariable Calculus</td>
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<td>Computer Science II: Analyzing Data with Python</td>
<td>Japanese Language through Culture I</td>
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<td>Computer Science II: Java</td>
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ART, MEDIA, AND DESIGN

Semester 1

CREATIVE NONFICTION: This course focuses on the art of shaping real experiences into powerful narratives. Students will examine diverse professional examples of the relevant and evolving genre of creative nonfiction while developing their own original works, reflecting stories from their lives and from the communities around them. Participants will establish a personalized library of mentor texts and authors, pursue opportunities for publication, learn from successful contributors to the genre, and deepen their individual understandings of crucial elements of writer’s craft and the creative process. They will support one another as a community of active, practicing, innovative writers. Feedback is an essential component of this course, and students will gain experience in the workshop model, learning how to effectively critique and learn from one another’s writing in a global, digital environment. This course embraces the expression and development of writing skills in a variety of forms, including audio, video, graphic novel, and traditional text.

DIGITAL PHOTOGRAPHY: In an era where everyone has become a photographer obsessed with documenting most aspects of life, we swim in a sea of images, whether posted on Instagram, Facebook, Snapchat, Pinterest, or another digital medium. Yet what does taking a powerful and persuasive photo with a 35mm digital single lens reflex (DSLR) camera require? Digital photography explores this question in a variety of ways, beginning with the technical aspects of using and taking advantage of a powerful camera then moving to a host of creative questions and opportunities. Technical topics such as aperture, shutter, white balance, and resolution get ample coverage in the first half of the course, yet each is pursued with the goal of enabling students to leverage the possibilities that come with manual image capture. Once confident about technical basics, students apply their skills when pursuing creative questions such as how to understand and use light, how to consider composition, and how to take compelling portraits. Throughout the course, students tackle projects that enable sharing their local and diverse settings, ideally creating global perspectives through doing so. Additionally, students interact with each other often through critique sessions and collaborative exploration of the work of many noteworthy professional photographers, whose images serve to inspire and suggest the diverse ways that photography tells visual stories. Prerequisite: Students must have daily access to a DSLR camera.

FILMMAKING: This course is for students interested in developing their skills as filmmakers and creative problem-solvers. It is also a forum for screening the work of their peers and providing constructive feedback for revisions and future projects, while helping them to develop critical thinking skills. The course works from a set of specific exercises based on self-directed research and builds to a series of short experimental films that challenge students on both a technical and creative level. Throughout, we will increasingly focus on helping students express their personal outlooks and develop their unique styles as filmmakers. We will review and reference short films online and discuss how students might find inspiration and apply what they find to their own works. Prerequisite: Students must have access to an HD video camera, tripod or other stabilizing equipment, and editing software such as iMovie, Premiere Pro, etc.

POETRY WRITING: This poetry writing workshop explores identity and seeks to answer the question: How are you shaped (or not) by the community you live in? Our goal is to create a supportive online network of writers that uses language to discover unique and mutual understandings of what it means to be a global citizen from a local place. Students draft and revise poems, provide and receive frequent feedback, and read a range of modern and contemporary poets whose work is grounded in place. Sample assignments include audio and video recording, an online journal, study of performance poetry, peer video conferences, close reading, investigations into process and craft, collaborative poetry anthologies, and a class publication. All writers have the opportunity to send their work to international contests and publications.
Semester 2

ADVOCACY*: This skills-based course explores the creativity, effort, and diversity of techniques required to change people's minds and motivate them to act. Students learn how to craft persuasive arguments in a variety of formats (written, oral, and multimedia) by developing a campaign for change around an issue about which they care deeply. We explore a number of relevant case studies and examples as we craft our campaigns. Units include persuasive writing, social media, public speaking, informational graphics, and more. The culminating project is a multimedia presentation delivered and recorded before a live audience.
*Cross-listed in GOA Learning Studios

ARCHITECTURE: In this course, students build understanding and apply skills in aspects of site; structure, space and design. While gaining key insights into the roles of architectural analysis, materials, 3D design, and spatial awareness, students develop proficiency in architectural visual communication. We begin by learning the basic elements of architectural design to help analyse and understand architectural solutions. Then, through using digital and physical media use models to enhance visual communication, students study the role building materials play in architectural design, developing an understanding of the impact materials have on structural design and cultural traditions. At each stage of the course students interact with peers from around the globe, learning and sharing how changes in materials, technology, and construction techniques lead to the evolution of contemporary architecture style and visual culture. The course culminates with a final project in which each aspiring architect will have the opportunity to work towards a personal presentation for the GOA Catalyst Conference. Students will, through a variety of outcomes, present an architectural intervention which they have proposed as a solution to an identified need, one emanating from or focused within their own community. Throughout the course students will refer to the design process and will use visual journaling techniques to track, reflect and evidence their burgeoning understanding of architecture, construction, and engineering.

COMPUTER SCIENCE II: GAME DESIGN AND DEVELOPMENT*: In this course, students design and develop games through hands-on practice. Comprised of a series of "game jams," the course asks students to solve problems and create content, developing the design and technical skills necessary to build their own games. The first month of the course is dedicated to understanding game design through game designer Jesse Schell’s "lenses": different ways of looking at the same problem and answering questions that provide direction and refinement of a game’s theme and structure. During this time, students also learn how to use Unity, the professional game development tool they use throughout the class. They become familiar with the methodologies of constructing a game using such assets as graphics, sounds, and effects, and controlling events and behavior within the game using the C# programming language. Throughout the remainder of the course, students will work in teams to brainstorm and develop new games in response to a theme or challenge. Students will develop their skills in communication, project- and time- management, and creative problem-solving while focusing on different aspects of asset creation, design, and coding. Prerequisites: Computer Science I: Computational Thinking or its equivalent.
*Cross-listed in Mathematics and Technology

FICTION WRITING: This course connects students interested in creative writing (primarily short fiction) and provides a space for supportive and constructive feedback. Students gain experience in the workshop model, learning how to effectively critique and discuss one another's writing in an online environment. In addition to developing skills as readers within a workshop setting, students strive to develop their own writing identities through a variety of exercises. The course capitalizes on the geographic diversity of the students by eliciting stories that shed light on both the commonalities and differences of life experiences in different locations. Additionally, we read and discuss the work of authors from around the globe. Students’ essential responsibilities are twofold: to engage in the class as readers and writers and to focus on their development as readers and writers. Both require participation in discussions of various formats within our online community, as well as dedicated time outside of class reading and providing feedback on one another’s work and writing original pieces for the workshop.
GRAPHIC DESIGN: What makes a message persuasive and compelling? What helps audiences and viewers sort and make sense of information? This course explores the relationship between information and influence from a graphic design perspective. Using an integrated case study and design-based approach, this course aims to deepen students’ design, visual, and information literacies. Students are empowered to design and prototype communication projects about which they are passionate. Topics include: principles of design and visual communication, infographics, digital search skills, networks and social media, persuasion and storytelling with multimedia, and social activism on the internet. Student work will include individual and collaborative group projects, graphic design, content curation, some analytical and creative writing, peer review and critiques, and online presentations.

MUSIC THEORY AND DIGITAL COMPOSITION: In Music Theory and Digital Composition, students explore the structure, writing, and recording of music as a design problem, with the intention of creating and releasing a finished piece of original music. The first half of the semester is focused on the history of music, the staff, notation, scales, intervals, chords, and harmony. In conjunction with this is the use of two pieces of software called Auralia and Musition, which quickly attune to each student’s individual skill level in ear training and sight reading, respectively. This aids the student in writing an original composition, the quality and character of which is determined by personal music interests and learning more about their identified target audience. The foundation of the course is the Design Thinking model, which guides students through a process that begins with empathizing with their audience, defining their piece, iterating several design drafts, prototyping, and then releasing the finished recording for feedback and another iteration of refinement. The second half of the course is focused on performing, recording, mixing, mastering, and releasing a recording of their composition, all the while keeping key target audience members in the loop through surveys and conversations.
GOA LEARNING STUDIOS

GOA Learning Studios explore interdisciplinary topics through student-driven learning. Led by a teacher who designs the overall structure, these courses ask students to craft their own projects based on their interests and develop strong relationships with classmates through frequent conversation and feedback. Students can expect to learn how to identify relevant local and/or global issues to explore deeply, how to craft their own plans for structuring and exploring the issue, how to test new ideas both in and out of class, and how to be an active part of a community of learners. Learning Studios demand a high level of organizational and interpersonal skills, curiosity, determination, and flexibility.

Offered in Semesters 1 and 2

POSITIVE PSYCHOLOGY*: What is a meaningful, happy, and fulfilling life? The focus of psychology has long been the study of human suffering, diagnosis, and pathology, but in recent years, however, positive psychologists have explored what’s missing from the mental health equation, taking up research on topics such as love, creativity, humor, and mindfulness. In this course, we’ll dive into what positive psychology research tells us about the formula for a meaningful life, the ingredients of fulfilling relationships, and changes that occur in the brain when inspired by music, visual art, physical activity, and more. We’ll seek out and lean on knowledge from positive psychology research and experts, such as Martin Seligman’s Well Being Theory, Mihaly Csikszentmihalyi’s idea of flow, and Angela Lee Duckworth’s concept of grit. In exploring such theories and concepts, students will imagine and create real-world measurements using themselves and willing peers and family members as research subjects. As part of the learning studio format of the course, students will also imagine, research, design, and create projects that they’ll share with a larger community. Throughout the development of these projects, they’ll collaborate with each other and seek ways to make their work experiential and hands-on. Students will leave the class with not only some answers to the question of what makes life meaningful, happy, and fulfilling, but also the inspiration to continue responding to this question for many years to come.
*Cross-listed in Science and Health

Semester 1

ADVANCED TOPICS IN ECONOMICS*: What is the economic impact of professional sports teams on their local community? How does pollution in China affect vineyards in Italy? Why did the US financial market collapse in 2008 and how can we use this experience to predict our next global business cycle? In this course, students choose current events to explore through an economic lens. By building upon the principles discussed in microeconomics and macroeconomics, students analyze how the presence of scarcity affects the behaviors of individuals, businesses, and governments. This course reiterates the rational expectations of the principles courses while also introducing irrational behaviors to provide students a better look at their local economy. With guidance from the instructor, students choose topics related to the stock market, environment, entertainment industry, politics and more. Students research and analyze their economic issue and use their findings to formulate a solution to the problem. Through this course students will build upon their understanding of economic principles and their application. Student work will include the synthesis of data, analytical writing; peer collaboration; and a defense of their findings to a committee. Prerequisite: Completion of an introductory course in microeconomics OR macroeconomics (at GOA or elsewhere).
*Cross-listed in Social Sciences

ENTREPRENEURIAL LEADERSHIP*: A unique hybrid offering for the summer and fall of 2018. Entrepreneurial Leadership combines a rich immersion experience at African Leadership Academy’s residential campus in Johannesburg, South Africa followed by a 15-week online component offered through Global Online Academy that extends the foundational skills gained during the residential program to real-world concerns within each student’s local community. Students in this course will engage directly with ALA’s entrepreneurial leadership model alongside master educators and alumni.
committed to empowering this social impact on the African continent and beyond. This experience is open exclusively to rising seniors and juniors (anticipated graduation 2019 or 2020) from GOA member schools. Learn more: globalonlineacademy.org/entrepreneurial-leadership. **Students in this course must participate in both the residential and online components of this course. See “Entrepreneurship in a Global Context” for an online-only learning experience.**

*Cross-listed in Social Sciences

**SOCIAL PSYCHOLOGY**: Social psychology examines how the thoughts, feelings, and behaviors of a person are influenced by the actual, imagined, or implied presence of others. Students design research projects that explore contemporary issues relevant to this course, including but not limited to social media, advertising, peer pressure, and social conflict. In order to equip students to do this work, the course begins with an overview of research methods in psychology as well as several historical studies by Solomon Asch, Stanley Milgram, and Philip Zimbardo. Students develop foundational knowledge of social psychology by exploring a diversity of topics, including attitudes and actions, group behavior, prejudice and discrimination, interpersonal relationships, conformity, attraction, and persuasion. The capstone project of this course is student-designed research project that will be submitted for publication, presentation to an audience, or used to catalyze change in local communities.

*Cross-listed in Science and Health

**Semester 2**

**ADVOCACY**: This skills-based course explores the creativity, effort, and diversity of techniques required to change people's minds and motivate them to act. Students learn how to craft persuasive arguments in a variety of formats (written, oral, and multimedia) by developing a campaign for change around an issue about which they care deeply. We explore a number of relevant case studies and examples as we craft our campaigns. Units include persuasive writing, social media, public speaking, informational graphics, and more. The culminating project is a multimedia presentation delivered and recorded before a live audience.

*Cross-listed in Art, Media, and Design

**CLIMATE CHANGE AND GLOBAL INEQUALITY**: Nowhere is the face of global inequality more obvious than in climate change, where stories of climate-driven tragedies and the populations hit hardest by these disasters surface in every news cycle. In this course students will interrogate the causes and effects of climate change, and the public policy debates surrounding it. In case studies, we will research global, regional, and local policies and practices along with the choices of decision makers mean to the populations they serve. Who benefits, who suffers, and how might we change this equation? Following the Learning Studio model, in the second half of the course, students will work with their teacher to design their own independent projects, reflecting their individual interests and passions, and collaborate in workshops with classmates to deepen our collective understanding of the complex issues surrounding climate change. Throughout the semester we will build and curate a library of resources and share findings in varied media, engaging as both consumers and activists to bring increasing knowledge to challenge and advocate for sustainable norms. Finally, students will have the opportunity to reach a global audience, by participating in GOA’s Catalyst Conference in the spring 2019, as they present their individual projects to spark change in local communities through well-informed activism.

*Cross-listed in Social Sciences

**ENTREPRENEURSHIP IN A GLOBAL CONTEXT**: How does an entrepreneur think? What skills must entrepreneurs possess to remain competitive and relevant? What are some of the strategies that entrepreneurs apply to solve problems? In this experiential course students develop an understanding of entrepreneurship in today’s global market; employ innovation, design, and creative solutions for building a viable business model; and learn to develop, refine, and pitch a new start-up. Units include Business Model Canvas, Customer Development vs. Design Thinking, Value Proposition, Customer Segments, Iterations & Pivots, Brand Strategy & Channels, and Funding Sources. Students will use the Business Model Canvas as a roadmap to building and developing their own team start-up, a process that will require hypothesis testing, customer research conducted in hometown markets, product design, product iterations, and entrepreneur interviews. An online start-up pitch by the student team to an
entrepreneurial advisory committee will be the culminating assessment. Additional student work will include research, journaling, interviews, peer collaboration, and a case study involving real world consulting work for a current business.
*Cross-listed in Social Sciences
MATHEMATICS AND TECHNOLOGY

Offered in Semesters 1 and 2

COMPUTER SCIENCE I: COMPUTATIONAL THINKING: *This course (or its equivalent) is a prerequisite to all Computer Science II classes at GOA.* Computational thinking centers on solving problems, designing systems, and understanding human behavior. It has applications not only in computer science, but also myriad other fields of study. This introductory level course focuses on thinking like a computer scientist, especially understanding how computer scientists define and solve problems. Students begin the course by developing an understanding of what computer science is, how it can be used by people who are not programmers, and why it’s a useful skill for all people to cultivate. Within this context, students are exposed to the power and limits of computational thinking. Students are introduced to entry level programming constructs that will help them apply their knowledge of computational thinking in practical ways. They will learn how to read code and pseudocode as well as begin to develop strategies for debugging programs. By developing computational thinking and programming skills, students will have the core knowledge to define and solve problems in future computer science courses. While this course would be beneficial for any student without formal training as a programmer or computer scientist, it is intended for those with no programming experience.

iOS APP DESIGN: Learn how to design and build apps for the iPhone and iPad and prepare to publish them in the App Store. Students will work much like a small startup: collaborating as a team, sharing designs, and learning to communicate with each other throughout the course. Students will learn the valuable skills of creativity, collaboration, and communication as they create something amazing, challenging, and worthwhile. Coding experience is NOT required and does not play a significant role in this course. *Prerequisite: For this course, it is required that students have access to a computer running the most current Mac or Windows operating system. An iOS device that can run apps (iPod Touch, iPhone, or iPad) is also highly recommended.*

Semester 1

NUMBER THEORY: Once thought of as the purest but least applicable part of mathematics, number theory is now by far the most commonly applied: every one of the millions of secure internet transmissions occurring each second is encrypted using ideas from number theory. This course covers the fundamentals of this classical, elegant, yet supremely relevant subject. It provides a foundation for further study of number theory, but even more, it develops the skills of mathematical reasoning and proof in a concrete and intuitive way, good preparation for any future course in upper-level college mathematics or theoretical computer science. We progressively develop the tools needed to understand the RSA algorithm, the most common encryption scheme used worldwide. Along the way we invent some encryption schemes of our own and discover how to play games using number theory. We also get a taste of the history of the subject, which involves the most famous mathematicians from antiquity to the present day, and we see parts of the story of Fermat’s Last Theorem, a 350-year-old statement that was fully proven only twenty years ago. While most calculations will be simple enough to do by hand, we will sometimes use the computer to see how the fundamental ideas can be applied to the huge numbers needed for modern applications. *Prerequisite: A strong background in precalculus and above, as well as a desire to do rigorous mathematics and proofs.*

Semester 2

COMPUTER SCIENCE II: ANALYZING DATA with PYTHON: In this course, students utilize the Python programming language to read, analyze, and visualize data. The course emphasizes using real world datasets, which are often large, messy, and inconsistent. Because of the powerful data structures and clear syntax of Python, it is one of the most widely used programming languages in scientific
computing. Students explore the multitude of practical applications of Python in fields like biology, engineering, and statistics. **Prerequisite: Computer Science I: Computational Thinking or its equivalent.**

**COMPUTER SCIENCE II: GAME DESIGN AND DEVELOPMENT***: In this course, students practice designing and developing games through hands-on practice. Comprised of a series of "game jams," the course asks students to solve problems and create content, developing the design and technical skills necessary to build their own games. The first month of the course is dedicated to understanding game design through game designer Jesse Schell's "lenses": different ways of looking at the same problem and answering questions that provide direction and refinement of a game's theme and structure. During this time, students also learn how to use Unity, the professional game development tool they use throughout the class. They become familiar with the methodologies of constructing a game using such assets as graphics, sounds, and effects, and controlling events and behavior within the game using the C# programming language. Throughout the remainder of the course, students will work in teams to brainstorm and develop new games in response to a theme or challenge. Students will develop their skills in communication, project- and time- management, and creative problem-solving while focusing on different aspects of asset creation, design, and coding. **Prerequisites: Computer Science I: Computational Thinking or its equivalent.**

**GAME THEORY**: Do you play games? Do you ever wonder if you're using “the right” strategy? What makes one strategy better than another? In this course, we explore a branch of mathematics known as game theory, which answers these questions and many more. Game theory has many applications as we face dilemmas and conflicts every day, most of which we can treat as mathematical games. We consider significant global events from fields like diplomacy, political science, anthropology, philosophy, economics, and popular culture. Specific topics include two-person zero-sum games, two person non-zero-sum games, sequential games, multiplayer games, linear optimization, and voting and power theory.

**LINEAR ALGEBRA**: In this course students learn about the algebra of vector spaces and matrices by looking at how images of objects in the plane and space are transformed in computer graphics. We do some paper-and-pencil calculations early in the course, but the computer software package Geogebra (free) will be used to do most calculations after the opening weeks. No prior experience with this software or linear algebra is necessary. Following the introduction to core concepts and skills, students analyze social networks using linear algebraic techniques. Students will learn how to model social networks using matrices and to discover things about the network with linear algebra as your tool. We will consider applications like Facebook and Google. **Prerequisite: Geometry and Algebra 2 or the equivalents.**

**Yearlong**

**MULTIVARIABLE CALCULUS**: In this course students learn to differentiate and integrate functions of several variables. We extend the Fundamental Theorem of Calculus to multiple dimensions, and the course will culminate in Green's, Stokes' and Gauss' Theorems. The course opens with a unit on vectors, which introduces students to this critical component of advanced calculus. We then move on to study partial derivatives, double and triple integrals, and vector calculus in both two and three dimensions. Students are expected to develop fluency with vector and matrix operations. Understanding of a parametric curve as a trajectory described by a position vector is an essential concept, and this allows us to break free from 1-dimensional calculus and investigate paths, velocities, and other applications of
science that exist in three-dimensional space. We study derivatives in multiple dimensions, we use the ideas of the gradient and partial derivatives to explore optimization problems with multiple variables, and we consider constrained optimization problems using Lagrangians. After our study of differentials in multiple dimensions, we move to integral calculus. We use line and surface integrals to calculate physical quantities especially relevant to mechanics and electricity and magnetism, such as work and flux, and we employ volume integrals for calculations of mass and moments of inertia. We conclude with the major theorems (Green's, Stokes', Gauss') of the course, applying each to some physical applications that commonly appear in calculus-based physics. *Pre-requisite: The equivalent of a college year of single-variable calculus, including integration techniques, such as trigonometric substitution, integration by parts, and partial fractions. Completion of the AP Calculus BC curriculum with a score of 4 or 5 on the AP Exam would be considered adequate preparation.*
SCIENCE AND HEALTH

Offered in Semesters 1 and 2

BIOETHICS: Ethics is the study of what one should do as an individual and as a member of society. In this course students evaluate ethical issues related to medicine and the life sciences. During the semester, students explore real-life ethical issues, including vaccination policies, organ transplantation, genetic testing, human experimentation, and animal research. Through reading, writing, and discussion, students learn basic concepts and skills in the field of bioethics, deepen their understanding of biological concepts, strengthen their critical-reasoning skills, and learn to engage in respectful dialogue with people whose views may differ from their own. In addition to journal articles and position papers, students will be required to read Rebecca Skloot’s *The Immortal Life of Henrietta Lacks*.

INTRODUCTION TO PSYCHOLOGY: What does it mean to think like a psychologist? In *Introduction to Psychology*, students explore three central psychological perspectives – the behavioral, the cognitive, and the sociocultural – in order to develop a multi-faceted understanding of what thinking like a psychologist encompasses. The additional question of “How do psychologists put what they know into practice?” informs study of the research methods in psychology, the ethics surrounding them, and the application of those methods to practice. During the first five units of the course, students gather essential information that they apply during a group project on the unique characteristics of adolescent psychology. Students similarly envision a case study on depression, which enables application of understandings from the first five units. The course concludes with a unit on positive psychology, which features current positive psychology research on living mentally healthy lives. Throughout the course, students collaborate on a variety of activities and assessments, which often enable learning about each other’s unique perspectives while building their research and critical thinking skills in service of understanding the complex field of psychology.

MEDICAL PROBLEM SOLVING I: In this course students collaboratively solve medical mystery cases, similar to the approach used in many medical schools. Students enhance their critical thinking skills as they examine data, draw conclusions, diagnose, and treat patients. Students use problem-solving techniques in order to understand and appreciate relevant medical/biological facts as they confront the principles and practices of medicine. Students explore anatomy and physiology pertaining to medical scenarios and gain an understanding of the disease process, demographics of disease, and pharmacology. Additional learning experiences include studying current issues in health and medicine, building a community-service action plan, interviewing a patient, and creating a new mystery case.

POSITIVE PSYCHOLOGY*: What is a meaningful, happy, and fulfilling life? The focus of psychology has long been the study of human suffering, diagnosis, and pathology, but in recent years, however, positive psychologists have explored what’s missing from the mental health equation, taking up research on topics such as love, creativity, humor, and mindfulness. In this course, we’ll dive into what positive psychology research tells us about the formula for a meaningful life, the ingredients of fulfilling relationships, and changes that occur in the brain when inspired by music, visual art, physical activity, and more. We’ll seek out and lean on knowledge from positive psychology research and experts, such as Martin Seligman’s Well Being Theory, Mihaly Csikszentmihalyi’s idea of flow, and Angela Lee Duckworth’s concept of grit. In exploring such theories and concepts, students will imagine and create real-world measurements using themselves and willing peers and family members as research subjects. As part of the learning studio format of the course, students will also imagine, research, design, and create projects that they’ll share with a larger community. Throughout the development of these projects, they’ll collaborate with each other and seek ways to make their work experiential and hands-on. Students will leave the class with not only some answers to the question of what makes life meaningful, happy, and fulfilling, but also the inspiration to continue responding to this question for many years to come.
*Cross-listed in GOA Learning Studios

**Semester 1**

**GLOBAL HEALTH:** What makes people sick? What social and political factors lead to the health disparities we see both within our own community and on a global scale? What are the biggest challenges in global health and how might they be met? Using an interdisciplinary approach to address these two questions, this course improves students’ health literacy through an examination of the most significant public-health challenges facing today's global population. Topics include the biology of infectious disease (specifically HIV and Malaria); the statistics and quantitative measures associated with health issues; the social determinants of health; and the role of organizations (public and private) in shaping the landscape of global health policy. Students use illness as a lens through which to examine social issues like poverty, gender, and race. Student work includes analytical and creative writing, research, peer collaboration, reading and discussions of nonfiction, and online presentations.

**SOCIAL PSYCHOLOGY**: Social psychology examines how the thoughts, feelings, and behaviors of a person are influenced by the actual, imagined, or implied presence of others. Students design research projects that explore contemporary issues relevant to this course, including but not limited to social media, advertising, peer pressure, and social conflict. In order to equip students to do this work, the course begins with an overview of research methods in psychology as well as several historical studies by Solomon Asch, Stanley Milgram, and Philip Zimbardo. Students develop foundational knowledge of social psychology by exploring a diversity of topics, including attitudes and actions, group behavior, prejudice and discrimination, interpersonal relationships, conformity, attraction, and persuasion. The capstone project of this course is a student-designed research project that will be submitted for publication, presentation to an audience, or used to catalyze change in local communities. This course may be taken as a continuation of Introduction to Psychology, although doing so is not required.

*Cross-listed in GOA Learning Studios

**Semester 2**

**ABNORMAL PSYCHOLOGY:** This course focuses on psychiatric disorders such as schizophrenia, eating disorders, anxiety disorders, substance abuse, and depression. As students examine these and other disorders, they learn about their symptoms, diagnoses, and treatments. Students also deepen their understanding of the social stigmas associated with mental illnesses. This course may be taken as a continuation of Introduction to Psychology, although doing so is not required.

**MEDICAL PROBLEM SOLVING II:** This course is an extension of the problem-based learning done in Medical Problem Solving I. While collaborative examination of medical case studies will remain the core work of the course, students will tackle more complex cases and explore new topics in medical science, such as the growing field of bioinformatics. Students in MPS II will also have opportunities to design cases based on personal interests, discuss current topics in medicine, and apply their learning to issues in their local communities. **Prerequisite: Medical Problem Solving I.**

**NEUROPSYCHOLOGY:** This course is an exploration of the neurological basis of behavior. It covers basic brain anatomy and function as well as cognitive and behavioral disorders from a neurobiological perspective. Additionally, students explore current neuroscience research as well as the process of funding that research. Examples of illnesses that may be covered include: Alzheimer’s disease, traumatic brain injury, and stroke. In addition, we explore diagnostic and treatment issues (including behavioral and pharmaceutical management) as well as attention, learning, memory, sleep, consciousness and emotional intelligence. Students conclude the course by developing a fundraising campaign to support research and/or patient care initiatives related to a specific neurological condition and nonprofit foundation. Neuropsychology can be taken as a continuation of Introduction to Psychology, although it is not required.
SOCIAL SCIENCES

Offered in Semesters 1 and 2

9/11 IN A GLOBAL CONTEXT: September 11, 2001 was a tragic day that changed the world in profound ways. In this course students explore the causes of 9/11, the events of the day itself, and its aftermath locally, nationally, and around the world. In place of a standard chronological framework, students instead view these events through a series of separate lenses. Each lens represents a different way to view the attacks and allows students to understand 9/11 as an event with complex and interrelated causes and outcomes. Using a variety of technologies and activities, students work individually and with peers to evaluate each lens. Students then analyze the post-9/11 period and explore how this event affected the U.S., the Middle East, and the wider world.

Semester 1

ADVANCED TOPICS IN ECONOMICS*: What is the economic impact of professional sports teams on their local community? How does pollution in China affect vineyards in Italy? Why did the US financial market collapse in 2008 and how can we use this experience to predict our next global business cycle? In this course, students choose current events to explore through an economic lens. By building upon the principles discussed in microeconomics and macroeconomics, students will analyze how the presence of scarcity affects the behaviors of individuals, businesses, and governments. This course reiterates the rational expectations of the principles courses while also introducing irrational behaviors to provide students a better look at their local economy. With guidance from the instructor, students choose topics related to the stock market, environment, entertainment industry, politics, and more. Students research and analyze their economic issue and use their findings to formulate a solution to the problem. Through this course students build upon their understanding of economic principles and their application. Student work includes the synthesis of data, analytical writing, peer collaboration, and a defense of their findings to a committee. Prerequisite: An introductory course in microeconomics OR macroeconomics (at GOA or elsewhere).

*Cross-listed in GOA Learning Studios

APPLYING PHILOSOPHY TO MODERN GLOBAL ISSUES: This is an applied philosophy course that connects pressing contemporary issues with broad-range philosophical ideas and controversies, drawn from multiple traditions and many centuries. Students use ideas from influential philosophers to examine how thinkers have applied reason successfully, and unsuccessfully, to many social and political issues across the world. In addition to introducing students to the work of philosophers as diverse as Confucius, Kant, John Rawls and Michel Foucault, this course also aims to be richly interdisciplinary, incorporating models and methods from diverse fields including history, journalism, literary criticism, and media studies. Students learn to develop their own philosophy and then apply it to the ideological debates which surround efforts to improve their local and global communities.

ENTREPRENEURIAL LEADERSHIP*: A unique hybrid offering for the summer and fall of 2018. Entrepreneurial Leadership combines a rich immersion experience at African Leadership Academy’s residential campus in Johannesburg, South Africa, followed by a 15-week online component offered through Global Online Academy that extends the foundational skills gained during the residential program to real-world concerns within each student’s local community. Students in this course will engage directly with ALA’s entrepreneurial leadership model alongside master educators and alumni committed to empowering social impact on the African continent and beyond. This experience is open exclusively to rising seniors and juniors (anticipated graduation 2019 or 2020) from GOA member schools. Learn more: globalonlineacademy.org/entrepreneurial-leadership. Students in this course must participate in both the residential and online components of this course. See “Entrepreneurship in a Global Context” for an online-only learning experience.
GENOCIDE AND HUMAN RIGHTS: Students in this course study several of the major genocides of the 20th century (Armenian, the Holocaust, Cambodian, and Rwandan), analyze the role of the international community in responding to and preventing further genocides (with particular attention to the Nuremberg tribunals), and examine current human rights crises around the world. Students read primary and secondary sources, participate in both synchronous and asynchronous discussions with classmates, write brief papers, read short novels, watch documentaries, and develop a human rights report card website about a nation in the world of their choice.

INTRODUCTION TO INVESTMENTS: In this course, students simulate the work of investors by working with the tools, theories, and decision-making practices that define smart investment. We explore concepts in finance and apply them to investment decisions in three primary contexts: portfolio management, venture capital, and social investing. After an introduction to theories about valuation and risk management, students simulate scenarios in which they must make decisions to grow an investment portfolio. They manage investments in stocks, bonds, and options to learn a range of strategies for increasing the value of their portfolios. In the second unit, they take the perspective of venture capital investors, analyzing startup companies and predicting their value before they become public. In the third unit, students examine case studies of investment funds that apply the tools of finance to power social change. Throughout the course, students learn from experts who have experience in identifying value and managing risk in global markets. They develop their own ideas about methods for taking calculated financial risks and leave this course not just with a simulated portfolio of investments, but the skills necessary to manage portfolios in the future.

MICROECONOMICS: In this course, students learn about how consumers and producers interact to form a market and then how and why the government may intervene in that market. Students deepen their understanding of basic microeconomic theory through class discussion and debate, problem solving, and written reflection. Students visit a local production site and write a report using the market principals they have learned. Economic ways of thinking about the world will help them better understand their roles as consumers and workers, and someday, as voters and producers.

Semester 2

CLIMATE CHANGE AND GLOBAL INEQUALITY*: Nowhere is the face of global inequality more obvious than in climate change, where stories of climate-driven tragedies and the populations hit hardest by these disasters surface in every news cycle. In this course students will interrogate the causes and effects of climate change, and the public policy debates surrounding it. In case studies, we will research global, regional, and local policies and practices along with the choices of decision makers mean to the populations they serve. Who benefits, who suffers, and how might we change this equation? Following the Learning Studio model, in the second half of the course, students will work with their teacher to design their own independent projects, reflecting their individual interests and passions, and collaborate in workshops with classmates to deepen our collective understanding of the complex issues surrounding climate change. Throughout the semester we will build and curate a library of resources and share findings in varied media, engaging as both consumers and activists to bring increasing knowledge to challenge and advocate for sustainable norms. Finally, students will have the opportunity to reach a global audience, by participating in GOA’s Catalyst Conference in the spring 2019, as they present their individual projects to spark change in local communities through well-informed activism.

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COMPARATIVE POLITICS: In 2012, the Economist issued a report entitled “Democracy at a Standstill.” This course uses the comparative model to ask students to consider whether democracy is in fact at a standstill, but more importantly, if and why we should care. By looking at current events, reading scholarly research, analyzing data, conducting personal interviews, and engaging in a series of debates, students assess the status of democracy in the world and also explore the challenges and alternatives to
democratic systems. In so doing, they constantly reevaluate their own beliefs and understandings about how power should be distributed and utilized.

**ENTREPRENEURSHIP IN A GLOBAL CONTEXT**: How does an entrepreneur think? What skills must entrepreneurs possess to remain competitive and relevant? What are some of the strategies that entrepreneurs apply to solve problems? In this experiential course, students develop an understanding of entrepreneurship in today's global market; employ innovation, design, and creative solutions for building a viable business model; and learn to develop, refine, and pitch a new start-up. Units of study include Business Model Canvas, Customer Development vs. Design Thinking, Value Proposition, Customer Segments, Iterations & Pivots, Brand Strategy & Channels, and Funding Sources. Students use the Business Model Canvas as a roadmap to building and developing their own team start-up, a process that requires hypothesis testing, customer research conducted in hometown markets, product design, product iterations, and entrepreneur interviews. An online start-up pitch by the student team to an entrepreneurial advisory committee is the culminating assessment. Additional student work includes research, journaling, interviews, peer collaboration, and a case study involving real world consulting work for a current business.

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**GENDER STUDIES**: This course uses the concept of gender to examine a range of topics and disciplines that includes feminism, gay and lesbian studies, women's studies, popular culture, and politics. Throughout the course students examine the intersection of gender with other social identifiers: class, race, sexual orientation, culture, and ethnicity. Students read about, write about, and discuss gender issues as they simultaneously reflect on the ways that gender has manifested in and influenced their lives.

**MACROECONOMICS**: Macroeconomics is the study of economic units as a whole rather than of their individual components. The aggregate unit is usually a national economy and that will be our focus in this course. Students will learn to better understand how to measure national economic activity with concepts like gross domestic product, unemployment and inflation and the strengths and weaknesses of these statistics. Students will then study theoretical methods of influencing national economic activity with monetary and fiscal policy and will learn about some of the controversy surrounding these policy tools. The advantages and disadvantages of international trade and of methods of setting exchange rates will also be introduced. The course will include an individual student investigation of a national economy other than their home country. Students will identify their economic findings and present resolutions in their final report.

**PRISONS AND THE CRIMINAL LAW**: Criminal courts in the United States have engaged in an extraordinary social experiment over the last 40 years: they have more than quintupled America’s use of prisons and jails. Has this experiment with “mass incarceration” produced more bad effects than good? Is it possible at this point to reverse the experiment without doing even more harm? In this course, students become familiar with the legal rules and institutions that determine who goes to prison and for how long. Along the way, students gain a concrete, practical understanding of legal communication and reasoning while grappling with mass incarceration as a legal, ethical, and practical issue. In an effort to understand our current scheme of criminal punishments and to imagine potential changes in the system, we immerse ourselves in the different forms of rhetoric and persuasion that brought us to this place: we read and analyze the jury arguments, courtroom motions, news op-eds, and other forms of public persuasion that lawyers and judges create in real-world criminal cases. Topics include the history and social functions of prisons; the definition of conduct that society will punish as a crime; the work of prosecutors, defense attorneys, and judges in criminal courts to resolve criminal charges through trials and plea bargains; the sentencing rules that determine what happens to people after a conviction; the alternatives to prison when selecting criminal punishments; and the advocacy strategies of groups hoping to change mass incarceration. The reading focuses on criminal justice in the United States, but the course materials also compare the levels of imprisonment used in justice systems around the world. Assignments will ask students to practice with legal reasoning and communication styles, focused on specialized audiences such as juries, trial judges, appellate judges, sentencing commissions, and legislatures. The work will involve legal research, written legal argumentation, peer collaboration, and oral advocacy.
Note: This course is offered through Wake Forest University School of Law and is taught by Ronald Wright, the Needham Y. Gulley Professor of Criminal Law. Students who take this course should expect a college-level workload (8-10 hours a week). Successful completion of this course will be rewarded with a certificate from the law school.
WORLD LANGUAGES (YEARLONG)

ARABIC LANGUAGE THROUGH CULTURE: This unique, mixed-level course is designed to help motivated students develop interpersonal communication skills in Arabic as well as build the skills required to be a successful 21st century language learners. This course has an explicit focus on Levantine dialect and the cultures of the Middle East and North African (MENA). Students in levels I to III share the same communal classroom and collaborate with their teachers to assess their proficiency level and begin at the appropriate unit. Coursework includes English-language culture units as well as a series of language learning units. Language units consist primarily of asynchronous learning experiences and synchronous conversations with instructors, peers from all levels, and discussion partners at King’s Academy in Jordan. In addition to building their speaking and writing skills, students learn to leverage a modern understanding of language acquisition, how to align goals with practice, how to ask questions, how to curate resources from the internet and an extended network of Arabic speakers. Proficiency targets are based on the 2017 NCSSFL-ACTFL Can-Do Statements.

Arabic I
Through study of Levantine (Jordanian) Arabic and the Arabic writing system, students develop Novice proficiency in interpersonal communication. Students will be able to communicate in spontaneous spoken conversations on very familiar and everyday topics, including personal introductions, families, daily routines, and preferences, using a variety of practiced or memorized words, phrases, simple sentences, and questions.

Arabic II
Arabic II students have one year of Arabic Language Through Culture or have demonstrated Novice proficiency through summer coursework or other experiences. Students will communicate in spontaneous spoken conversations on familiar topics, including food, weather, and hobbies, using a variety of practiced or memorized words, phrases, simple sentences, and questions.

Arabic III
Students in Arabic III have demonstrated Intermediate interpersonal proficiency in Arabic (MSA or a dialect) through two years in Arabic Language Through Culture or other coursework, and have demonstrated an ability to work online independently and reliably with instructors and peers in Arabic Language Through Culture or another GOA class. Students in Arabic III will have opportunities to direct their own study through choice of material and topic. They will use Arabic to interact with native speakers on topics of their choosing, and to explore topics of interest through a variety of media (written works, audio, video, face-to-face interviews).

JAPANESE LANGUAGE THROUGH CULTURE I: This full-year course is a unique combination of Japanese culture and language, weaving cultural comparison with the study of basic Japanese language and grammar. While examining various cultural topics such as literature, art, lifestyle and economy, students learn the basics of the Japanese writing system (Hiragana and Katakana), grammar and vocabulary. Through varied synchronous and asynchronous assignments, including hands-on projects and face-to-face communications, students develop their speaking, listening, reading and writing skills. The cultural study and discussions are conducted in English, with topics alternating every two to three weeks. The ultimate goal of this course is to raise awareness and appreciation of different cultures through learning the basics of the Japanese language. The focus of this course is 60 percent on language and 40 percent on culture. This course is appropriate for beginner-level students.

JAPANESE LANGUAGE THROUGH CULTURE II: Through language learning, students in this course share their voices, cultivate global perspectives, and foster appreciation of self and others. Students expand their knowledge of the basic skills introduced in Japanese Language Through Culture I while further developing their speaking, listening, writing, and reading skills. Each unit follows the IPA model (Integrated Performance Assessment), blending three modes of communication: interpretation of
authentic material in Japanese, synchronous and asynchronous practice in speaking and writing, and oral and written presentations. Each unit focuses on one of the following cultural topics: Design and Expression, Ecology, Entertainment, East meets West, Harmony, and Nature. In addition, students will have the opportunity to select and pursue topics of their own interest. Grammar topics will cover the essential forms that are typically introduced in the second and third year of a high school Japanese program. By learning the Dictionary Form, Nominalizer, TE form, TA form, NAI form, and Noun Modifier, students are able to add more complexity to their sentence construction. In doing so, they shift from forming simple sentences to communicating in a coherent paragraph. As online learners, students are expected to exhibit superb time management and communication skills, as well as to take ownership of their learning. While grammar instruction will be delivered through asynchronous work and face-to-face meetings, much of the course content will be curated and created by students through their research and collaboration. The focus of this course is 60 percent on language and 40 percent on culture.

Prerequisite: Japanese Language Through Culture I or permission from the instructor.