



Upper School
Program of Studies
2017-2018

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 units of English**, must be enrolled in English each semester.
- 3 units of Mathematics**, must enroll in a year-long Mathematics course each year through the junior year with a minimum completion of Algebra II.
- 3 units of Social Studies**, must complete The World to 1500, The World Since 1500, and American Civilization (History).
- 3 units of Science**, Biology is required in 9th grade and Chemistry is required in 10th grade.
- 3 units of Language**, must complete two consecutive years of the same language. The third unit may be completed by starting a new language.
- 2 units 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 units of electives**
- 1.5 units 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 their 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.

The Pembroke Hill School
Graduation Requirements Worksheet

Student's Name

Advisor's Name

Subject	Grade 9	Grade 10	Grade 11	Grade 12
English (4 units required)	English 9	English 10	American Civilization English	AP English 12
Mathematics (3 units required)* *4 units strongly recommended or required by many colleges/universities				
Social Studies (3 units required)	World to 1500	World Since 1500	American Civilization History	
Science (3 units required)* *Physics or AP Physics 1 is strongly recommended as the 3 rd unit	Biology	Chemistry or Chemistry Accelerated		
Foreign Language (3 units required—2 of which must be consecutive levels of the same language)				
Fine Arts (2 units required, including two 1/2-unit Foundation courses: Visual Art and either Theatre Arts, Debate I or Exploration in Music. The remaining one unit may be completed by taking any combination of Performing and/or Visual arts offerings)				
Electives (2 units required)				
Physical Education (1.5 units)* *See Reverse	Concepts of Physical Fitness (0.75 units)	Lifetime Physical Fitness* *If student did not participate in PHS Athletics/P.E. Independent Study in Grade 9		

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, Internet resources, 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. Students have the opportunity to join the student book club and discuss literature of their choice with classmates in a relaxed setting. 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 earn, gain, and experience more freedom and autonomy in responsibly self-directing their academic studies.

The Kemper Library recognizes the American Association of School Librarians Information Literacy Standards as a general guide for instruction and programming.

Computer Science & Technology

Computer science is a dynamic discipline, constantly evolving as techniques improve and new ones are developed. Pembroke Hill offers an inquiry-based, hands-on curriculum in Computer Science. Courses in the department teach critical thinking, as well as problem solving skills and analysis.

Programming classes offered include Python and Java. The College Board uses Java as the language for the Advanced Placement Computer Science exam. The AP course is offered on a bi-yearly rotation.

There is no computer science requirement for graduation.

Python Programming

(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 welcomed (no previous programming skills are required), although an interest in mathematics is helpful.

Computer Architecture and Server Design

(Spring)

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 e-mail. Additionally, students will gain a basic understanding of networking and protocol.

3D Printing and Design

(Fall or 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 in PLA and ABS plastic.

Mobile Applications Development

(Fall & Spring)

*May be taken for credit in **either** Computer Science or Visual Art*

This course is designed to teach students how to design, develop and implement their own mobile applications for the iPad. This emerging process for programming directly on the iPad is ever evolving. With the use of online tutorials students will learn the key functions of iPad programming and graphics to create applications. After mastering the tutorials, they will design applications both individually and in groups by creating the design, layout

and specific technologies required for their application. The iPads are used to program, test, and debug the designs, as well as to correct screen resolution, dimensions, buttons and touch actions.

Java Programming (Fall or Spring)

This one semester course introduces students to Java programming with emphasis on the object-oriented paradigm for both conventional and web-site 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 pre-requisite for AP Computer Science 2018-2019.

English

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 them 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 a 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 semester 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. 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 topics 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 tragedy, focusing on the characteristics of the tragic figure that are rooted in Sophocles' *Oedipus*. The rest of the quarter may include works such as *Othello* or *Macbeth* and *The Raisin in the Sun*. Other quarter topics are philosophical works involving titles such as *The Metamorphosis* and *The Elegance of the Hedgehog* and the gothic genre reflected in works like *Frankenstein* and *Jane Eyre*.

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.

First Semester Options

We're all going to Hell – Representations of Hell in Contemporary Literature

What is it about Hell that so consistently captures the imagination? Beyond its religious role, Hell has long been a prominent fixture in the cultural landscape. This course will investigate the origins of Hell in literature and then consider the ways in which the idea of Hell has been appropriated in more contemporary works. We will read excerpts from the blueprint for literary Hell, Dante Alighieri's *Inferno*, and then apply Dante's conception of the nine circles of suffering to works published since 1945. These texts will include works by authors such as Primo Levi, Seamus Heaney, Don DeLillo, Haruki Murakami and Angela Carter, amongst others. Throughout our study

we will be considering what exactly inspires the label “Hell”, and how invoking the word ‘Hell’ can in fact mean something positive. The semester will culminate in a research paper for which students will select a infernal text upon which to focus.

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 essay 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 quarter, all students will choose literary topics related specifically to activist literature such as *Invisible Man*, *A Boy's Own Story*, *The Handmaid's Tale*, *Germinal*, as well as stories from Philip K. Dick, Upton Sinclair, Louise Erdrich and many others. 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.

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, the book review, and a mini-research experience and presentation focused on one writer. Students will spend time outside of class reading books of contemporary poetry (such as Dana Levin's *Banana Palace* and Kevin Prufer's *National Anthem*) and short-fiction (Mary Gaitskill, John Cheever, Amy Hempel), and also exemplary stage (Sam Shepard) and screen plays (*Fargo* by the Coen brothers), depending upon their selected focus. They will decide between short fiction or playwriting, and from there stage or screen. Students will also 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.

Philosophy and Literature

In this course, students will engage with texts that challenge their vision of humanity as well as the social and political constructs that inhabit their world. Using a variety of novels from the world canon and philosophical essays from *The Stone Reader*, students will consider philosophical, political, and psychological interpretations. Selections could include McCarthy's *All the Pretty Horses*, Shakespeare's *Hamlet*, Conrad's *Heart of Darkness*, Marquez' *Chronicle of a Death Foretold*, Camus' *The Stranger*, Woolf's *Mrs. Dalloway*, and Frankl's *Man's Search for Meaning*, as well as a variety of poetry. Making connections with literature, history, and psychology students have studied in their Pembroke career as well as looking ahead to life beyond high school will frame student-led seminars this semester. Students will be challenged with questions such as, “Can violence be just?” and “How does the value of competition compare to the value of cooperation?” Students will be assessed through analytical discussions, daily journal entries, presentations, and essays.

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.

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 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 positive 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 are 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, recommended to be taken in the 9th or 10th grade, serves as an introduction to all aspects of the Theatrical Arts, providing a basis for continued study in those areas of greatest interest. Critical and creative thinking will be emphasized in the study of dramatic literature and theatre history. Fundamental acting and design skills will be developed through creative lectures, discussion, and exercises. Students will also explore the fundamentals of speech organization and delivery.

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. Coming out 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. This 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. The 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 which have remained the same for hundreds of years. Students will gain knowledge of the major composers, pieces, and events which 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. The 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 even more 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.

Exploration in Music (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. Coming out of this course, a student should have the tools to be a life-long learner in music.

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 this 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, recommended to be taken in the 9th or 10th grade, serves as an introduction to all aspects of the Theatrical Arts, providing a basis for continued study in those areas of greatest interest. Critical and creative thinking will be emphasized in the study of dramatic literature and theatre history. Fundamental acting and design skills will be developed through creative lectures, discussion, and exercises. Students will also explore the fundamentals of speech organization and delivery.

Acting I (Fall)

Prerequisite: Theatre Arts, Declared Acting Focus

This course is designed to introduce the fundamentals of ensemble and exploration as it relates to acting and the performing arts. We will focus on self awareness, collaboration, storytelling, and confidence to build a foundation for performance. We will explore these elements through creative lecture, discussion, exercise, improvisation, script analysis, and scene work.

Acting II (Fall)

Prerequisite: Acting I or Instructor Approval

Note: This course is offered every other year in rotation with Advanced Scene Study.

Acting II will build on the foundations of Acting I by exploring more deeply the development of character through continued script analysis, scene and monologue work. We will also approach auditioning skills and acting theory.

Advanced Scene Study (Spring)

Prerequisite: Acting II or Instructor Approval

This course is designed to help advanced acting students develop their own approach to acting, and to solidify the discipline and skills necessary to approach a script and a role. The course will also include an exploration of a variety of period styles through research, movement, design, and performance.

Repertory Theatre (Spring)

Prerequisite: Acting II or Instructor approval

The purpose of this semester long course is to give the student an increased appreciation of and additional experience in theater as an art form. The student will act, direct, or be technically involved in scenes and one-act play productions. Most rehearsals will take place during the school day. They will also read, write and evaluate plays as well as view and critique electronic and live performances. Through creating theater, students will grow in their ability to comprehend the world and to communicate with others.

Elements of Theatrical Design (Fall or Spring)

Prerequisite: Theatre Arts

This course provides students with a fundamental understanding of technical elements related to theatrical arts. This course 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.

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 auditioning process. This course will give students insight into the audition process from both the auditor's and auditionee's standpoint. Topics covered will include: company research, professional resume creation, monologue selection and preparation, and perhaps cold reading approaches. Familiarity with these theories in addition to practical experiences will improve the student's understanding of the world of the actor and improve his/her abilities to creatively and productively collaborate with others far beyond these classroom walls. Additionally, students should leave the course with a "package" including: an updated professional resume, three audition-ready monologues (minimum of two contrasting contemporary and one classical) and a song (or two).

Movie Making (Spring)

The class is designed for students interested in cinema photography, producing, acting, and the editing of short video productions. Students will learn the basics of film making. They will act in numerous on-camera exercises and will ultimately work in groups to develop their own original short films. During the semester, students will learn to perform a number of film crew positions. The projects are intended to develop students' visual, film, story telling and technical abilities through the medium of video.

Debate I

(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.

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.

Video Journalism

(Fall or Spring)

Prerequisites: Exploration of Music, Theatre Arts, or Debate I Foundations Course

Video Journalism operates as a project-based classroom where collaborative groups are responsible for creating a school newscast as well as various video segments. Basic standards of storytelling, videography and broadcast writing will be covered in this class. The ability to conduct interviews and communicate effectively on camera are integral to this class. This course will make use of technology through camera work and video editing software. Students will also critique film of news sources and examine news media and its impact on current events.

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.

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 interested student may be recommended by an art department faculty member 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 commitment in the Visual Arts, taking at least one visual art class each year. In addition, focus students are assured a spot in a selected art class 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 take 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 line, shape, form, composition, value, and color theory. 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. Work will explore the challenges of drawing 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. Students will 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, 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. 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 metal smiths, 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 development 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 given 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 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.*

Printmaking I or II (Fall)

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 (Spring)

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 sophomore or 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. The student will investigate a wide range of materials as he develops artwork that communicates his personal voice and vision. Students are expected to work at school and at home throughout the school year. The student's 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 a minimum of 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 address depth and space articulated through additive, subtractive, and/or fabrication processes such as ceramics, sculpture, and silversmithing.

The Drawing Portfolio is designed to address a very broad interpretation of drawing issues. This 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 in interest, performance, and work ethic.

The students will learn methods of pre-press design and supporting computer software. Students will become proficient in using Adobe: InDesign, Photoshop, and Illustrator, as well as skills which 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, and 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 and juniors 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 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.

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 Chinese students must demonstrate proficiency speaking 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 skills 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 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 take 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. Since speaking French is the primary means by which the different themes/topics will be explored, language skills will improve and develop throughout the course of the year. Readings 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.

To improve reading comprehension, students will deal with a variety of materials, including a selection of literary works and journalism. 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 improve skills necessary for the exam. Students will take practice tests containing material directly applicable to the AP Exam. Presentation of francophone cultures will be an integral part of the course.

Latin I / Latin II (Full Year)

These two sequential courses introduce students to the language and cultural history of the Romans, whose civilization largely influenced our society and government. We use *The Cambridge Latin Course*, which features stories of increasing difficulty with the eventual goal of reading proficiency. After successful completion of the introductory sequence, students will be prepared to read unabridged Latin prose in Latin III. Each chapter of the book presents new concepts and terms, including grammar, vocabulary, Roman culture and Roman history, as well as English vocabulary through the study of words derived from Latin. Students will also study stories from Greco-Roman mythology.

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. For the final quarter, the class will focus on the poetry of Ovid. 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, as well as 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. They will 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)

It is the objective of this beginning course 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 lengthier assignments. Students will expand the vocabulary that they learned in Spanish I, as well as review and build on the grammatical concepts from the previous year. The 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 chose 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, Hispanic Literature Studies

Although many different regions and nations of the Spanish-speaking world share a common language, they each have their own cultures and traditions which make them distinctly different. Each semester elective course will cover different topics selected by the teacher which may include geography, politics, history, music, food, film or literature of the nations represented. The goal is to familiarize students with cultural elements of these nations and to develop a respect for the common Spanish heritage. Students will also review grammatical topics as needed and vocabulary in order to improve in all skill areas. The titles and topics of each semester course will vary so that students have the option to take four consecutive semester courses without repetition of the central theme.

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 History of Math. 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, beginning concepts of plane and solid 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, conic sections. Emphasis is placed on techniques of problem solving and the acquisition of mathematical reasoning skills.

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.

Pre-Calculus

This course is designed to prepare students for Calculus. During the first semester, emphasis is placed on a variety of functions and their graphs, solving equations involving absolute value, roots and radicals, and 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, the student should have all the pre-calculus topics mastered and be well prepared to begin his/her study of Calculus.

Pre-Calculus Accelerated

This is the first course in the two-year Advanced Placement Calculus sequence. During the first semester, emphasis is placed on a variety of functions and the graphs of these functions, solving equations and inequalities, absolute value, radicals, polynomials, and the mastery of trigonometry. Second semester is devoted to exponential and logarithmic functions, systems of equations, linear programming, conic sections, sequences, series, probability and beginning calculus topics. The majority of fourth quarter is spent on calculus topics. After completing this course, the student should have all of the pre-calculus topics mastered and be well prepared for an AP Calculus course.

Calculus

This is a first course in Calculus. Topics covered include differentiation and integration of algebraic, exponential, and trigonometric functions. Emphasis will be placed on applications such as optimization and related rates as well as analysis of the graphs of functions to prepare the student for subsequent calculus courses.

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, thus preparing students for the AB Advanced Placement Exam. The course covers 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 do 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

Problem Solving Basics

*(Prerequisite is successful completion of **Geometry** and/or instructor recommendation)*

This course focuses on problem solving to explore a wide variety of mathematics. Problem sets will be completed by students each week over different topics. Problem sets often resemble questions from math contests and draw upon a deep understanding of concepts for their solutions. 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: Exponents and Logarithms, Complex numbers, proportions, number theory, circles, angles, polygons, functions, series and sequences, proof, sets, and probability and counting. 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 and geometry.

Introduction to Probability and Counting

*(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:

*(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 up 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.

History of Mathematics:

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

Where did math come from? Who thought up all those algebra symbols, and why? What's the story behind ...negative numbers? ...the metric system? ...quadratic equations? ...sine and cosine? This course will answer these questions and many others in an informal, easygoing style that's accessible to students, and anyone who is curious about the history of mathematical ideas. The course will use Questions and Projects to help students learn more about various topics and to see how its main ideas fit into the bigger picture of history. The course will include a bird's-eye overview of the entire panorama of mathematical history, a whirlwind tour of the most important people, events, and trends that shaped the mathematics we know today. Additional readings will be suggested to provide starting points for students who want to pursue a topic further. It is ideal for students who want to know a little more about the origins of mathematics.

Differential Equations:

*(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:

*(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 learn how to describe the tangent plane in terms of ideas of calculus, and 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.

THE PEMBROKE HILL SCHOOL

MATHEMATICS CURRICULUM FOR THE MIDDLE AND UPPER SCHOOL

Some typical programs

7th	8th	9th	10th	11th	12th
Algebra 1-7	Algebra 1-8	Geometry or Geometry Acc.	Algebra II Algebra II Acc.	Pre-Calculus Pre-Calculus Acc.	Calculus AP Calculus (AB/BC) AP Statistics
Algebra I Acc.	Geometry Acc.	Algebra II Acc.	Pre-Calculus Acc.	AP Calculus (AB/BC)	AP Statistics or Semester Electives
		Transition to Geometry	Geometry	Algebra II	Pre-Calculus

- 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 on-line courses cannot be substituted for a year-long course offered in the Upper School.
- 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.
- 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 (.25 per quarter) 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 QUARTER 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 no required practices on Sundays. Other than weekend and non-school days, practices are usually held immediately after school and last 2 to 2 ½ hours.

Seasons

Fall

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

<i>Boys</i>	<i>Girls</i>
Cross Country	Cheerleading
Football	Cross Country
Soccer	Field Hockey
Swimming and Diving	Tennis
	Golf
	Volleyball

Winter

Practices begin around the last week of October and may continue into the second week of March depending upon state playoffs.

Boys

Basketball
Wrestling

Girls

Basketball
Cheerleading
Dance
Swimming and Diving

Spring

Practices begin around the third week of February and may continue until the first week of June depending on state playoffs.

Boys

Baseball
Golf
Lacrosse
Tennis
Track & Field

Girls

Soccer
Track & Field
Lacrosse

Science

Under the graduation guidelines, each student is required to take three years of science in the upper school. All students are required to take Biology in ninth grade and Chemistry in tenth grade.

Electives have been added to make it possible to tailor a program individual to the student. Chemistry should be taken prior to Physics or any of the advanced placement sciences, but the semester electives may be scheduled at any time after the sophomore year. Juniors and seniors may double in science without departmental approval.

Many colleges consider three years of secondary science as a minimum for acceptance. 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.

It is a requirement that students take the basic sciences—Biology and Chemistry—before electing to take Advanced Placement courses or electives. A suggested science course sequence follows these course descriptions.

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

This course is designed to give students a comprehensive introduction to the study of life science. Topics included are: biochemistry, cell structure and function, heredity, evolution, taxonomy, anatomy and physiology, and ecology. Frequent classroom activities and laboratory work reinforces conceptual understanding and develops analytical skills. The course incorporates new developments in biology and explores current-day applications resulting from this research. Students will be evaluated on homework, laboratory reports, tests, class participation, and various papers and projects.

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

This course 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.

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

This course serves as a general introduction to chemistry and as 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 that 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.

AP Chemistry (Full Year)

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

This 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.

Physics (Full Year)

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

This 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 Physics C Mechanics and Electricity & Magnetism (Full Year)

Prerequisites: AP Physics 1 and Calculus

Students must have at least a B+ average in AP Physics 1, 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.

AP Environmental Science (Full Year)

Prerequisites: Biology and Chemistry with at least a B+ average, or permission from course instructor

This class 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, and online activities. 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.

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. Several body systems will be surveyed. Lab work will include a significant amount of dissection, including 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 reading, research projects, videos, and classroom discussions. This course will also include the study of diseases and disorders and strategies for maintaining and improving health.

Optics and Modern Physics (Fall)

Prerequisite: Physics

Optics and Modern Physics is a semester course examining the physics of light and selected topics in modern physics. We will study the wave properties of light (reflection, refraction, diffraction, and interference) and the formation of images via geometric optics. Then, we will go "beyond Newton" to delve conceptually into such mind-bending topics as particle/wave duality, the photoelectric effect, relativity, and quantum mechanics. Learning will be supported with lab work and hands-on activities. We will enhance our explorations with documentaries and popular reading including "A Brief History of Time" by Stephen Hawking.

Science and Society (Fall)

Prerequisites : Biology and Chemistry

This course will examine some of the greatest scientific challenges of the 21 st 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.

The Atomic Age (Spring)

Prerequisite: Chemistry

The Atomic Age is a semester course that will investigate the science and history of the development of the atomic bomb. We will explore the transmutation of elements (how does one atom transform into another?), radioactivity, the biological effects of radiation, and nuclear fission and fusion. By taking an interdisciplinary approach, we will consider the following questions: In what ways do the events of history drive the arms race? How are nuclear reactors different than atomic bombs? Is nuclear energy “safe?” We will explore these topics through scientific and nonfiction reading, hands-on demonstrations, film, and independent research.

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, that 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)

Prerequisites: 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

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 Elective

12th grade (students may take more than one):

Physics
AP Physics 1
AP Physics C
AP Chemistry
AP Biology
AP Environmental Science
Semester Science Elective

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’ coming 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 specifically will look 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 this question, 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. A.P 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.

2017-2018 STUDENT COURSE CATALOG

AT GOA, WE LEARN DIFFERENTLY.

The GOA experience connects you to a global network of people and resources: students and teachers come from more than sixty of the best independent schools around the world. Just by taking a GOA class, you will meet and collaborate with people you might never otherwise know.

GOA courses are...

- **Interactive:** You'll log in multiple times a week to engage in discussions, collaborate on projects, and apply your knowledge in creative ways. No hours of video watching or test-taking here.
- **Challenging:** Similar to a course at your home school, you'll spend 5-7 hours a week working on your course. GOA courses are mostly asynchronous; you are not expected to show up at one place at one time every day. Instead, you'll have to become proactive about managing your schedule, asking for help when you need it, and overcoming obstacles and solving problems on your own. You'll be challenged to become a more independent learner.
- **Relevant:** GOA courses give you a chance to explore topics you care about in a way that feels creative and engaging. We design courses so you have the opportunity to curate, create, and reflect on content that helps you understand course concepts in real-world contexts.
- **Communal:** We cap our classes at 18 students so you can form strong relationships as you collaborate with both your teacher and peers.

WE'LL SEE YOU ONLINE!

DEPARTMENT DESIGNATIONS

Unless otherwise noted, courses are one semester long.

Art, Media, and Design		
Architecture	Digital Journalism	Graphic Design
Citizen Artist's Studio: From Making to Action	Digital Photography	Music Theory and Digital Composition
Creative Nonfiction	Fiction Writing	Poetry Writing
Computer Science II: Game Design and Development	Filmmaking	

GOA Learning Studios		
Advanced Topics in Economics	Entrepreneurship in a Global Context	Water
Advocacy	Power: Redressing Inequity through Data	
Citizen Artist's Studio: From Making to Action	Social Psychology	

Mathematics and Technology		
Computer Science I: Computational Thinking	Computer Science II: Java	Linear Algebra
Computer Science II: Analyzing Data with Python	Game Theory	Multivariable Calculus (yearlong)
Computer Science II: Game Design and Development	iOS App Design	Number Theory

Science and Health		
Abnormal Psychology	Medical Problem Solving I	Practical Astronomy
Bioethics	Medical Problem Solving II	Social Psychology
Global Health	Neuropsychology	
Introduction to Psychology	Organic Chemistry	

Social Sciences		
9/11 in a Global Context	Energy	Introduction to Investments
Applying Philosophy to Modern Global Issues	Gender Studies	Macroeconomics
Comparative Politics	Genocide and Human Rights	Microeconomics

World Languages (yearlong)	
Arabic Language through Culture I	Japanese Language through Culture I
Arabic Language through Culture II	Japanese Language through Culture II

CONCENTRATIONS

These concentrations don't fall under traditional departments or disciplines; rather, they help you think about the kind of learning you want to do at GOA. As you explore our course catalog, you'll see our courses tagged with a concentration — many of them with more than one — so you can more easily envision the kind of work you'll be doing in the course.

1. Adopting New Modes of Thinking for Innovative Problem Solving [MoT]		
Applying Philosophy to Modern Global Issues	Entrepreneurship in a Global Context	Medical Problem Solving II
Citizen Artist's Studio: From Making to Action	Game Theory	Multivariable Calculus
Computer Science I: Computational Thinking	Introduction to Investments	Number Theory
Computer Science II: Analyzing Data with Python	iOS App Design	Power: Redressing Inequity through Data
Computer Science II: Game Design and Development	Linear Algebra	Practical Astronomy
Computer Science II: Java	Medical Problem Solving I	

2. Building Empathy by Understanding Human Behavior [EMP]		
Abnormal Psychology	Comparative Politics	Genocide and Human Rights
Advanced Topics in Economics	Creative Nonfiction	Introduction to Psychology
Advocacy	Digital Journalism	Microeconomics
Applying Philosophy to Modern Global Issues	Entrepreneurship in a Global Context	Neuropsychology

Citizen Artist's Studio: From Making to Action	Fiction Writing	Poetry Writing
Computer Science I: Computational Thinking	Game Theory	Social Psychology
Computer Science II: Game Design and Development	Gender Studies	

3. Catalyzing Change in Your Community and Beyond [CHG]

Advanced Topics in Economics	Comparative Politics	Medical Problem Solving II
Advocacy	Entrepreneurship in a Global Context	Power: Redressing Inequity with Data
Citizen Artist's Studio: From Making to Action	Gender Studies	Water

4. Designing in a Technology-rich World [DES]

Architecture	Computer Science II: Java	Graphic Design
Citizen Artist's Studio: From Making to Action	Digital Photography	iOS App Design
Computer Science II: Game Design and Development	Filmmaking	Music Theory and Digital Composition

5. Exploring and Applying a Diversity of Cultural Perspectives [DIV]

9/11 in a Global Context	Comparative Politics	Gender Studies
Applying Philosophy to Modern Global Issues	Creative Nonfiction	Genocide and Human Rights
Arabic Language through Culture I	Digital Journalism	Japanese Language through Culture I

Arabic Language through Culture II	Energy	Japanese Language through Culture II
Architecture	Entrepreneurship in a Global Context	Poetry Writing
Bioethics	Fiction Writing	Water

6. Supporting Sustainability in the Context of Globalization [SUS]

Advanced Topics in Economics	Entrepreneurship in a Global Context	Microeconomics
Bioethics	Global Health	Organic Chemistry
Energy	Macroeconomics	Water

COURSE DESCRIPTIONS

KEY DATES

SEMESTER 1: Wednesday, September 6 - Friday, December 15, 2017

SEMESTER 2: Wednesday, January 17 – Friday, April 27, 2018

YEARLONG: Both Semesters

ART, MEDIA, AND DESIGN

SEMESTER 1

CITIZEN ARTIST’S STUDIO: FROM MAKING TO ACTION [MoT] [EMP] [CHG] [DIV]*: In this course, each student is an artist who utilizes the world of apps, memes, gifs, loops, views, posts, subs, and tweets to build an understanding of how digital art attracts audiences, affects social media platforms, sparks political activism, and transforms wherever you are into a production studio. The first half of the course is dedicated to tinkering with a plethora of software choices and media for self-expression: websites like YouTube, Giphy, Twine, and Pixlr; apps like Sketch, Paper 53, ProCreate, Boomerang, Aurasma, Prisma, Pic Collage, and Meme Generator; and social media classroom accounts on Instagram, Snapchat, and Twitter. Throughout, we’ll explore how art can aid in seeking unity, defending or defying norms, responding to opposing views, and envisioning better worlds. In the second half of the course, students use the Design Thinking model to identify a need in their community and fulfill the role of the citizen artist by addressing it through use of digital tools. Curricular content includes study of the effects of digital art on current events, lessons and tutorials on artistic techniques, and a history of citizen artwork both on and offline. Throughout the course, students engage in discussion and critique with each other, with students from other GOA classes, with their community contacts, and with professionals invited as guests of the course. *Prerequisites: Students should have daily access to a tablet or smartphone with reliable internet access.*

*Cross-listed in GOA Learning Studios

CREATIVE NONFICTION [EMP] [DIV]: This course focuses on shaping real experiences into powerful narratives. Students learn how to identify the genre of creative nonfiction both through the examination of professional examples of this genre and their own work of creative nonfiction. Students learn how to write in the genre of creative nonfiction both by exploring great stories in their lives and in

the world around them and by effectively and respectfully writing about other people and their experiences. Feedback is an essential component of this course, and students will gain experience in the workshop model, learning how to effectively critique and discuss one another's writing in a digital environment. In addition, students have the opportunity to use technology to transform written work into audio experiences.

DIGITAL JOURNALISM [EMP] [DIV]: In a time when anyone and everyone has the right to write and the ability to publish, what does it mean to be a journalist? Students in this course learn fundamentals of reporting and shaping stories in text and multimedia; they learn to implement standards for copyright and fair use; and they learn to recognize excellence and bias in journalism from professional and amateur sources. In addition, students will skills in media literacy, becoming informed and thoughtful consumers of news in an increasingly rich but fragmented information landscape. This introductory course is intended for students with little to no experience with the craft of journalism. Experienced student journalists are encouraged to take Creative Nonfiction, which focuses on longer form work.

DIGITAL PHOTOGRAPHY [DES]: 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. *Prerequisites: Students must have daily access to a DSLR camera.*

FILMMAKING [DES]: 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.

POETRY WRITING [EMP] [DIV]: The 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 [EMP] [CHG]*: 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 [DES] [DIV]: In this course students explore the field of architecture through a series of units covering elements of architectural design, materials and structure, architectural analysis, and 3D design. Students begin the course by learning the basic elements of architectural design and then using Google SketchUp to build models of these elements. In the second unit students will study

buildings like the Stonehenge, the Parthenon in Athens, the Roman Aqueduct of Pont du Gard in France, and the Pantheon in Rome to develop an understanding of materials and structures. At each stage students will learn how changes in materials, technology, and construction techniques lead to the evolution of architecture over time. In the third unit students will learn how to analyze structures using Ancient Greek temples as an example. The course will end with a final project in which each student will have the opportunity to design and build a sacred structure of their choice based on their new understanding of architecture, construction, and engineering.

COMPUTER SCIENCE II: GAME DESIGN AND DEVELOPMENT [MoT] [DES] [EMP]*: 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.*

***Cross-listed in GOA Learning Studios**

GRAPHIC DESIGN [DES]: 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.

FICTION WRITING [EMP] [DIV]: 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 a reader 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.

MUSIC THEORY AND DIGITAL COMPOSITION [DES]: 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.

SEMESTER 1

ADVANCED TOPICS IN ECONOMICS [EMP] [CHG] [SUS]*: 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 courses in microeconomics OR macroeconomics (at GOA or elsewhere).*

***Cross-listed in Social Sciences**

CITIZEN ARTIST'S STUDIO: FROM MAKING TO ACTION* [MoT] [EMP] [CHG] [DIV]: In this course, each student is an artist who utilizes the world of apps, memes, gifs, loops, views, posts, subs, and tweets to build an understanding of how digital art attracts audiences, affects social media platforms, sparks political activism, and transforms wherever you are into a production studio. The first half of the course is dedicated to tinkering with a plethora of software choices and mediums for self-expression: websites like YouTube, Giphy, Twine, and Pixlr; apps like Sketch, Paper 53, ProCreate, Boomerang, Aurasma, Prisma, Pic Collage, and Meme Generator; and social media classroom accounts on

Instagram, Snapchat, and Twitter. Throughout, we'll explore how art can aid in seeking unity, defending or defying norms, responding to opposing views, and envisioning better worlds. In the second half of the course, students use the Design Thinking model to identify a need in their community and fulfill the role of the citizen artist by addressing it through use of digital tools. Curricular content includes study of the effects of digital art on current events, lessons and tutorials on artistic techniques, and a history of citizen artwork both on and offline. Throughout the course, students engage in discussion and critique with each other, with students from other GOA classes, with their community contacts, and with professionals invited as guests of the course. *Prerequisites: Students should have daily access to a tablet or smartphone with reliable internet access.*

*Cross-listed in Art, Media, and Design

POWER: REDRESSING INEQUITY WITH DATA [MoT] [CHG]*: Students utilize research, data, their own sense of social justice, and the application of all three to right wrongs in our world. A collaborative track and an independent track will run concurrently throughout the semester. Collaboratively, the full class works through a unit on Power Frameworks (Nietzsche, Foucault, Weber, and French & Raven) followed by a series of inequality case studies that will provide insight into and practice with all six steps of the Power and Inequality Assessment (PIA) approach:

1. Identify specific inequality.
2. Provide and analyze data to substantiate the inequality.
3. Identify type(s) of power that created and are maintaining the inequality.
4. Provide and analyze data to substantiate power claim.
5. Present and explain specific action steps to redress inequality.
6. Identify type(s) of power necessary to implement action plan.

Independently, all students will apply the PIA approach to a specific local, national, or global inequality of their choosing. Past PIA projects have explored gender inequality in NCAA collegiate coaching; racial inequality in the American police force; and economic inequality in the treatment of immigrants, to name only a few. Regular, guided peer review will help students to hone their final products. Final PIA products will be presented in multimedia formats asynchronously online. Invited audience members will include GOA classmates; site directors and other members of home school communities; and experts from relevant fields.

*Cross-listed in Social Sciences

SOCIAL PSYCHOLOGY* [EMP] [CHG]: 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**

WATER [CHG] [SUS] [DIV]*: The second most common compound in the world, water is essential to life. It is also a cause of quick death. It sculpts mountains and reshapes coastlines. It gives rise to conflicts among neighbors and nations, yet it brings peace and pleasure to many. Characteristics of water can be studied in disciplines from art to zoology, and this course will touch on many of them through a set of case studies in the first five weeks. Those case studies are used to establish a pattern of questioning that shapes the rest of the course. For the next five weeks, students pursue answers to their favorite questions, choosing the disciplines on which to focus. They share their findings in a collaborative online environment and tag the connections among different areas of inquiry. They give and receive weekly critiques of each other's work, developing the skills to generate meaningful, actionable feedback. In the final month, individuals or groups design and complete projects that apply a multidisciplinary understanding of water to a specific, real world issue of their choice. These projects are submitted to relevant audiences in the public or private sector.

***Cross-listed in Science and Health, Social Sciences**

SEMESTER 2

ADVOCACY [EMP] [CHG]*: 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**

ENTREPRENEURSHIP IN A GLOBAL CONTEXT [MoT] [EMP] [CHG] [DIV] [SUS]*: 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 BOTH SEMESTER 1 AND 2

COMPUTER SCIENCE I: COMPUTATIONAL THINKING [MoT] [EMP]: *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 [MoT] [DES]: 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 (Mac OS X is necessary only if you plan to try your hand at publishing). An iOS device that can run apps (iPod Touch, iPhone, or iPad) is also highly recommended.*

SEMESTER 1

NUMBER THEORY [MoT]: 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 [MoT]: In this course, students utilize the Python programming language to read, manipulate and analyze 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: Completion of Computer Science I: Computational Thinking or its equivalent.*

COMPUTER SCIENCE II: GAME DESIGN AND DEVELOPMENT [MoT] [DES] [EMP]*: 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.*

***Cross-listed in Art, Media, and Design**

COMPUTER SCIENCE II: JAVA [MoT] [DES]: This course teaches students how to write programs in the Java programming language. Java is the backbone of many web applications, especially eCommerce and government sites. It is also the foundational code of the Android operating system and many tools of the financial sector. Students learn the major syntactical elements of the Java language though objected oriented design. The emphasis in the course will be on creating intelligent systems though the fundamentals of Computer Science. Students will write working programs through short lab assignments and more extended projects that incorporate graphics and animation. *Prerequisite: Computer Science I: Computational Thinking or its equivalent.*

GAME THEORY [MoT] [EMP]: 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 [MoT]: 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: completion of Geometry and Algebra 2 or the equivalents.**

YEARLONG

MULTIVARIABLE CALCULUS [MoT]: 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. We begin with a swift review of vectors, matrices, and parametric curves, with emphasis on those topics which are of value to multivariate 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 BOTH SEMESTER 1 AND 2

BIOETHICS [SUS] [DIV]: 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 [EMP]: 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 [MoT]: 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.

SEMESTER 1

GLOBAL HEALTH [SUS]: 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, and peer collaboration; reading and discussions of nonfiction; and online presentations.

PRACTICAL ASTRONOMY [MoT]: This course serves as a model of how modern astronomy has benefited from the digital revolution and advances in imaging technology. In the past two decades, the amount of information about our place in the universe has seen an explosive expansion. Our understanding of our own solar system has become fundamentally different in that short time. Students learn the modern techniques used by professional astronomers to gather and analyze data. The course reviews coordinate systems used in locating astronomical objects and the basics of spherical trigonometry. Students then wrestle with practical problems such as determining the orbits of newly discovered solar system objects such as minor planets and comets. Data from professional observatories is used to analyze the light curves of binary star systems and variable stars as well as to search for supernovae. These projects, given the global nature of the course, could include timing of occultations of stars by the Moon and asteroids, providing information vital to professional researchers. The Cranbrook Observatory at the Cranbrook Institute of Science in Bloomfield Hills, Michigan, USA, will be used as a source of data along with other international sources specific to each student for individual projects.

Prerequisite: successful completion of a course in trigonometry and geometry.

SOCIAL PSYCHOLOGY [EMP] [CHG]*: 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**

WATER [CHG] [SUS] [DIV]*: This inquiry-based course examines water as a physical element of the earth, an essential element of life, and a driver of human experience. Short case studies introduce students to the range of disciplines through which water can be studied, including oceanography, literature, and international relations. Then, the class develops a master list of questions such as: how is water used in human cells? How does it get to our homes? How do people live on and around it in low-lying areas? How does it shape mountains and vegetation? What happens when rivers change course at international borders? How do drought and flood influence history, art, and cultural practices? Working in small groups, students tackle such questions through online research, observation, and interviews with local experts. Their findings are collected in a publicly available website which serves as the basis for “action projects.” These student-designed projects will be created for specific audiences; they might involve building a prototype, creating a short film, or writing a formal proposal to an agency or organization.

***Cross-listed in GOA Learning Studios, Social Sciences**

SEMESTER 2

ABNORMAL PSYCHOLOGY [EMP]: 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 [MoT]: 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: completion of Medical Problem Solving I.*

NEUROPSYCHOLOGY [EMP]: 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.

ORGANIC CHEMISTRY [SUS]: This course is designed with two goals in mind: one pragmatic, and one philosophical. Pragmatically it provides a few foundational blocks for further studies in the organic chemistry field, giving students a small window on future, more traditional organic courses. Philosophically it aims to open an infinite world of discovery of complex molecules, their properties and reactions and applications, that hold the keys to confronting and solving the world's most challenging, future scientific problems. The emphasis of the course is on stimulating interest in organic chemistry through an exploration of the molecules relevant to modern life. Students can use this course as a springboard for further learning, as the beginning of a longer journey.

SOCIAL SCIENCES

OFFERED IN BOTH SEMESTER 1 AND 2

9/11 in a GLOBAL CONTEXT [DIV]: 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 [EMP] [CHG] [SUS]*: 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: Completion of an introductory courses in microeconomics OR macroeconomics (at GOA or elsewhere).*

***Cross-listed in GOA Learning Studios**

APPLYING PHILOSOPHY to MODERN GLOBAL ISSUES [MoT] [EMP] [DIV]: 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.

GENOCIDE AND HUMAN RIGHTS [EMP] [DIV]: 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 [MoT]: 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 [EMP] [SUS]: 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.

POWER: REDRESSING INEQUITY WITH DATA [MoT] [CHG]*: Students utilize research, data, their own sense of social justice, and the application of all three to right wrongs in our world. A collaborative track and an independent track will run concurrently throughout the semester. Collaboratively, the full class works through a unit on Power Frameworks (Nietzsche, Foucault, Weber, and French & Raven) followed by a series of inequality case studies that will provide insight into and practice with all six steps of the Power and Inequality Assessment (PIA) approach:

1. Identify specific inequality.
2. Provide and analyze data to substantiate the inequality.
3. Identify type(s) of power that created and are maintaining the inequality.
4. Provide and analyze data to substantiate power claim.
5. Present and explain specific action steps to redress inequality.
6. Identify type(s) of power necessary to implement action plan.

Independently, all students will apply the PIA approach to a specific local, national, or global inequality of their choosing. Past PIA projects have explored gender inequality in NCAA collegiate coaching; racial inequality in the American police force; and economic inequality in the treatment of immigrants, to name only a few. Regular, guided peer review will help students to hone their final products. Final PIA products will be presented in multimedia formats asynchronously online. Invited audience members will include GOA classmates; site directors and other members of home school communities; and experts from relevant fields.

***Cross-listed in GOA Learning Studios**

WATER [CHG] [SUS] [DIV]*: This inquiry-based course examines water as a physical element of the earth, an essential element of life, and a driver of human experience. Short case studies introduce students to the range of disciplines through which water can be studied, including oceanography, literature, and international relations. Then, the class develops a master list of questions such as: how is water used in human cells? How does it get to our homes? How do people live on and around it in low-lying areas? How does it shape mountains and vegetation? What happens when rivers change course at international borders? How do drought and flood influence history, art, and cultural practices? Working

in small groups, students tackle such questions through online research, observation, and interviews with local experts. Their findings are collected in a publicly available website which serves as the basis for “action projects.” These student-designed projects are created for specific audiences; they might involve building a prototype, creating a short film, or writing a formal proposal to an agency or organization.

***Cross-listed in GOA Learning Studios, Science and Health**

SEMESTER 2

COMPARATIVE POLITICS [EMP] [CHG] [DIV]: 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.

ENERGY [SUS] [DIV]: In this course, students develop a keen ability to analyze global energy issues. A historical and scientific exploration of fossil fuels gives students the foundation to tackle economic and environmental concerns related to traditional and alternative energy. Students do technical analyses of the rates of depletion of the reserves of major oil-producing countries and investigate the motivations for an oil-producing nation to become member of OPEC. Students take sides in major energy debates on topics like “fracking” or the international movement of energy supplies. In their final project, students present to their peers on all key aspects of an alternative energy source, including technical and economic viability and environmental sustainability.

ENTREPRENEURSHIP IN A GLOBAL CONTEXT [MoT] [EMP] [CHG] [DIV]*: 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.

***Cross-listed in GOA Learning Studios**

GENDER STUDIES [EMP] [CHG] [DIV]: 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 [SUS]: In this course students study macroeconomic theory as it relates to domestic and global policies on employment, national income, government spending, and the impact of foreign spending on domestic economies and foreign exchange markets. Students use real world events and data as case studies in order to develop a better understanding of the driving forces behind domestic and international macroeconomic markets. In the final portion of the course, students have the opportunity to develop their own solutions to a local/global issue of their choice (such as poverty, environmental pollution, and limited access to education) based on their new understanding of macroeconomic theory.

WATER [CHG] [SUS] [DIV]*: The second most common compound in the world, water is essential to life. It is also a cause of quick death. It sculpts mountains and reshapes coastlines. It gives rise to conflicts among neighbors and nations, yet it brings peace and pleasure to many. Characteristics of water can be studied in disciplines from art to zoology, and this course will touch on many of them through a set of case studies in the first five weeks. Those case studies are used to establish a pattern of questioning that shapes the rest of the course. For the next five weeks, students pursue answers to their favorite questions, choosing the disciplines on which to focus. They share their findings in a collaborative online environment and tag the connections among different areas of inquiry. They give and receive weekly critiques of each other's work, developing the skills to generate meaningful, actionable feedback. In the final month, individuals or groups design and complete projects that apply a multidisciplinary understanding of water to a specific, real world issue of their choice. These projects are submitted to relevant audiences in the public or private sector.

***Cross-listed in GOA Learning Studios, Science and Health**

WORLD LANGUAGES (YEARLONG)

ARABIC LANGUAGE THROUGH CULTURE I [DIV]: This full-year course highlights Modern Standard Arabic and some of the spoken dialect of the Levant. With an emphasis on Arabic culture, students learn commonly used expressions and phrases from the Levant area. Students develop their skills in listening, reading, writing, forming grammatically correct structured sentences, and most importantly, conversation. This is accomplished through podcasts, videos, culture circles discussions, web conferencing, and collaborations in group projects. In addition, students have direct conversations with native speakers of Arabic through a virtual club called “Shu Fe Maa Fe,” where students are required to meet online with their assigned partner and learn about a certain cultural topic every week, such as traditional food, greetings, gestures, values, history and more. Since Arabic is becoming one of the most functional languages in the world, especially in the areas of commerce, business, and trade, students participating in this course can avail themselves of the opportunity to learn the language in a highly stimulating and rich cultural context. The focus on this course is 60 percent on language and 40 percent on culture.

ARABIC LANGUAGE THROUGH CULTURE II [DIV]: This full-year course continues the work of Arabic Language Through Culture I, highlighting Modern Standard Arabic and the spoken dialect of the Levant. Grammar topics include continued exploration of the essential structures of Arabic (root/pattern systems) and verbs. Mastery of the alphabet (writing and reading) is an early goal of the course as it underlies more sophisticated work on sentence-writing skills. As in the first course, students develop their skills in listening, reading, writing, forming grammatically correct structured sentences, and, most importantly, conversation. Using these fundamental skills, students will explore and discuss current events related to cultural topics and have the opportunity to design their own inquiry projects to simultaneously build language skills and cultural understanding. The focus of this course is 60 percent on language and 40 percent on culture. *Prerequisite: Arabic Language through Culture I or permission from the instructor.*

JAPANESE LANGUAGE THROUGH CULTURE I [DIV]: 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 [DIV]: 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.