

# Upper School Course Catalog 2026-27

The Haverford School



# Table of Contents

Introduction	3
Course Request Process	4
Graduation Requirements	5
Course Offering Guidelines	6
Curriculum Overview Table	7
<b>Academics</b>	
English	10
Health & Physical Education	13
History	14
Mathematics	18
Modern & Classical Languages	25
Chinese	27
Latin	28
Spanish	29
Science	31
The Fine Arts	37
Performing Arts	38
Visual Arts	41
Prerequisites	45
<b>Co-Curricular Activities</b>	48
Athletics	49
Performing Arts	50
Clubs	51
Service Learning	52

# Introduction

The Haverford School is committed to preparing boys for life. Our college-preparatory educational program comprises academic, athletic, and community aspects that offers students both a broad exposure and grounding in several disciplines and the opportunity to pursue and develop more in-depth interests and an emphasis on the development of character and citizenship.

While most of our courses are heterogeneously grouped, certain advanced courses (marked with an asterisk \*) are homogeneously grouped. Within this framework, students are encouraged to pursue a course of study that challenges them beyond the minimum graduation requirements, while allowing time for participation in extracurricular activities and programs as well.

Choosing the course of study that is best for you requires thought and care. Students should consult parents, advisors, department chairs and administrators when choosing their courses.

The goal is to develop a course of study that:

- develops one's talents and aptitudes through a varied curriculum
- underscores talents and strengthens areas of relative weakness
- allows time for activities, sports and other extra-curricular activities
- challenges you to discover, develop, and expand areas of the liberal arts that can become sources of pride, joy and fulfillment and
- meets all graduation requirements.

**Newly Admitted Students:** A student entering the Upper School is placed in the appropriate level of Math and Language based on previous courses, testing, and consultation with the respective Department Chair. Students and families, especially those new to the Upper School, will work with the faculty, advisors, and the Head of Upper School in the course selection process. The Upper School Head will meet individually with new families in the Spring to schedule placement assessments and select electives available to the student's Form level.

# Course Request Process

## REVIEW THE COURSE CATALOG

Read through the graduation requirements, the Curriculum Overview Table, and have a tentative plan for your next four years. Consult with a parent/guardian, your Advisor, faculty mentors, teachers, and College Counselors (during Form V & VI years) for guidance on a courseload that challenges and interests you.

## COURSE RECOMMENDATIONS

Teachers will be recommending their current students for next school year's classes in March. Students will typically be recommended for the next class in their Math and Language sequence. Recommendations may include a provisional recommendation which allows students to work toward a specific goal by the year's end in order to change their recommendation. Faculty have an opportunity to alert the Registrar of any updated recommendations at the end of the school year.

## THE COURSE REQUEST PROCESS

After students have reviewed the Course Catalog and made a tentative plan, an electronic Course Request Form will be sent to students the week of their Spring Advisor/Parent Conference. Students will have the opportunity to rank their preference of electives within specific disciplines as well as their overall preference in electives. Students will be automatically placed in their recommended course in core History, Language, Math, and Science, unless they note their preference to opt out of a recommendation. Course Request Forms are due prior to Spring Break, and once submitted, changes will not be accepted or reviewed until after Preliminary Schedule Sheets are released in the summer.

## HONORS LEVEL REGISTRATIONS

A student's enrollment in an honors level class is a commitment for the year. Should a student want to drop the honors class, they need to initiate a conversation with their teacher and the Department Chair. It should be noted that moving class levels often disrupt the student's schedule.

## SCHEDULES RELEASED

There are two Schedules released during the summer:

**Preliminary Schedule Sheets** are typically published by August to the Veracross Student Portal.

The purpose of this schedule is to notify students their preliminary course of study for the year, specifically the electives that they received based on their rankings from the Course Request Form. It is during this point, students should contact the Registrar for any changes or questions they have regarding their courses. If an elective is at capacity, wait lists can be generated at this point and students will be notified via email if space becomes available through the summer and into the add/drop weeks of school.

**Finalized Schedules** are typically published mid-August and will contain the details of the student schedule including: block, teacher, room, and Advisory assignments. At this point of the Scheduling process, sections have been balanced and changes may not be possible in order to maintain balanced and desired class sizes.

## ADD/DROP

Students have an opportunity to add and/or drop a class during the first full cycle of classes in a semester. In order to add or change an elective, the requested class must:

1. Fit into the student's existing free block
2. Have capacity as determined by the Department

The add/drop process is initiated by the student by first meeting with their advisor and the teachers of the classes involved. Then, they will need to send an email to their parent, advisor, Upper School Head, College Counselor, the teacher(s) involved of the add/drop classes, and the Registrar. Everyone on the email will need to approve in order for the change to be made and for the student to begin the new schedule.

# Graduating Requirements

SUBJECT AREA	REQUIREMENT
ENGLISH	4 YEARS
HEALTH & WELLNESS	PHYSICAL EDUCATION & WELLNESS (FORM III) HEALTH (FORM IV)
HISTORY	3 YEARS
MATHEMATICS	3 YEARS THROUGH PRECALCULUS
MODERN & CLASSICAL LANGUAGES	2 CONSECUTIVE YEARS OF THE SAME LANGUAGE
SCIENCE	3 YEARS
ACTIVITY REQUIREMENT	3 ACTIVITY CREDITS IN FORM III & IV. 2 ACTIVITY CREDITS IN FORM V. 1 ACTIVITY CREDIT IN FORM VI
SENIOR PROJECT	1 YEAR DURING FORM VI
THE FINE ARTS	2 YEARS OR EQUIVALENT ACTIVITY

# Course Offering Guidelines

## **SINGLE SECTION ELECTIVES**

Non- required electives are offered if the number of course requests exceed nine students, and if an instructor is available.

## **HONORS COURSES**

Advanced courses designated with an asterisk (\*) are considered Haverford's most demanding courses and are designed to provide highly passionate students with rigorous academic experiences that move at an accelerated pace. Because we want every student to be successful, we are thorough and thoughtful in placing students in our most demanding honors courses. Entry into an honors course may vary by department and therefore students should refer to the prerequisite of each respective honors course to ensure they have met the requirements needed to successfully enroll in the course. Some departments require readiness diagnostics and other departments may require a specific grade and/or recommendation from the teacher and Department Chair in order to enroll.

## **LEVEL CHANGES**

Level changes between an honors level course and its standard counterpart after the class has commenced will be reviewed on an individual basis. A change in a level may result in adjusting other parts of the student's schedule in order to accommodate the level change and should be completed as early in the add/drop process as possible. After a quarter of the semester is complete, level changes will result in grades carrying over between courses. Changes to a student's level will not be processed after the midpoint of the semester.

## **NON-HAVERFORD COURSES**

Credit is not granted toward the graduation requirements for courses taken at a school other than Haverford, though coursework completed in Modern and Classical Languages and Mathematics in Middle School may allow a student to take more advanced courses in those subjects in Third Form.

## FORM III

Typical course offerings during the Form III year

ENGLISH	THE FINE & PERFORMING ARTS	HISTORY	LANGUAGE	MATH	SCIENCE
English I	Fundamentals of Music  Theater I  Visual Arts Foundations	Ancient World History	Chinese I Chinese II  Latin I Latin II Latin II*  Spanish I Spanish II Spanish II*	Algebra I  Geometry Geometry*  Algebra II Algebra II*	Physics I

## FORM IV

Typical course offerings during the Form IV year. Electives are *italicized*.

ENGLISH	THE FINE & PERFORMING ARTS	HISTORY	LANGUAGE	MATH	SCIENCE
English II: World Literature	<b><i>Electives:</i></b> <i>2D Art</i> <i>3D Art &amp; Design</i> <i>Ceramic Arts</i> <i>Digital Art &amp; Design</i> <i>Woodworking</i>  <i>Music</i> <i>Composition: Production &amp; Recording</i>  <i>Music Theory &amp; History*</i>  <i>Advanced Ensemble: Rock Band</i>  <i>Theater II</i>  <i>(and all Form III electives)</i>	Modern World History	Chinese II Chinese III Chinese III*  Latin II Latin II* Latin III Latin III*  Spanish II Spanish II* Spanish III Spanish III*	Geometry Geometry*  Algebra II Algebra II*  PreCalculus PreCalculus*  <b><i>Electives:</i></b> <i>Introduction to Computer Science</i>	Chemistry I Chemistry I*

## FORM V

Typical course offerings during the Form V year. Electives are *italicized*.

ENGLISH	THE FINE & PERFORMING ARTS	HISTORY	LANGUAGE	MATH	SCIENCE
English III: American Literature	<p><b>Electives:</b> <i>2D Art II*</i></p> <p><i>Ceramic Arts II*</i></p> <p><i>Digital Arts II*</i></p> <p><i>Woodworking II*</i></p> <p><i>3D Art &amp; Design II*</i></p> <p><i>Theater III: Acting*</i></p> <p><i>Theater III: Directing*</i></p> <p><i>(and all Form III &amp; IV electives)</i></p>	<p>United States History</p> <p>United States History*</p> <p><b>Electives:</b> <i>African American Studies</i></p> <p><i>Contemporary International Relations</i></p> <p><i>Global Financial Markets &amp; Investments</i></p> <p><i>Government &amp; Politics</i></p> <p><i>History &amp; Sociology of Sport</i></p>	<p><b>Electives:</b> <i>Chinese III</i> <i>Chinese III*</i> <i>Chinese IV</i> <i>Chinese IV*</i></p> <p><i>Latin III</i> <i>Latin III*</i> <i>Latin IV</i> <i>Latin IV*</i></p> <p><i>Spanish III</i> <i>Spanish III*</i> <i>Spanish IV</i> <i>Spanish IV*</i></p>	<p>Algebra II</p> <p>PreCalculus PreCalculus*</p> <p><b>Electives:</b> <i>Calculus</i></p> <p><i>Calculus*</i></p> <p><i>Advanced Computer Science*</i></p> <p><i>Finance: Financial Literacy</i></p> <p><i>Intro. to Computer Science</i></p> <p>Logic</p> <p><i>Math Modeling to Solve Social Challenges</i></p> <p><i>Statistics</i></p> <p><i>Statistics*</i></p>	<p>Biology I Biology I*</p> <p><b>Electives:</b> <i>Chemistry II:</i> <i>Applied Chem*</i> <i>Materials Science</i></p> <p><i>Engineering: Applications CAD</i></p> <p><i>Physics II:</i> <i>Astronomy</i> <i>Applied Physics*</i> <i>Electronics*</i> <i>Theoretical*</i></p>

## FORM VI

Typical course offerings during the Form VI year. Electives are *italicized*.

ENGLISH	THE FINE & PERFORMING ARTS	HISTORY	LANGUAGE	MATH	SCIENCE
English IV English IV* English IV Seminar	<b><i>Electives:</i></b> 2D Art Portfolio*  3D Art Portfolio*  Music Composition Senior Thesis*  (and all Form III, IV, V electives)	<b><i>Electives:</i></b> African American Studies  Contemporary International Relations  European Dictators*  Global Financial Markets & Invest.  Government & Politics  History of Science, Sex, and Culture*  History and Sociology of Sport  Social Psychology  The Global South: A Human Rights History*  The Civil War Era*	<b><i>Electives:</i></b> Chinese IV Chinese IV* Chinese V Chinese V*  Latin IV Latin IV*  Latin V Prose* Latin V Poetry* Spanish IV Spanish IV* Spanish V Cine Spanish V Conv. Spanish V Latin* Spanish V Literat*	PreCalculus PreCalculus*  <b><i>Electives:</i></b> Calculus  Calculus*  Advanced Computer Science*  Intro. to Computer Science  Econ. Micro*  Econ. Macro*  Finance: Financial Literacy  Logic  Math Modeling to Solve Social Challenges  Statistics  Statistics*	<b><i>Electives:</i></b> Biology II: Anatomy Biology of Sex Cellular Physiology* Molecular Biotechnology*  Chemistry II: Applied Chem* Materials Science  Engineering: Applications CAD  Environmental Science: Ethics/Policy Systems Thinking  Physics II: Astronomy Applied Physics* Electronics* Theoretical*

# English

The English Department is dedicated to educating boys to see the world around them clearly, critically, and sensitively. Through the study of literature, we strive to nurture young men to be thoughtful and generous forces in their communities and to be able to read, write, and speak with precision and power.

As students examine literature, they encounter attitudes and lives that expose them to new perspectives. As they write personal narratives, creative pieces, and analytic papers, they build and explore their rhetorical and artistic skills. As they speak in small discussion groups and in formal presentations, they discover their own voices and learn to listen to each other. The English program sharpens each student's critical awareness—in reading skills, in writing, and in oration. As students learn to recognize linguistic structures and possibilities, they also come to understand the basic elements intrinsic to literature of many genres. We know that close observation of textual detail enriches the rhetorical quality of thinking, writing, and speaking. We know that writing is a concentrated form of thinking, so we place special emphasis on the writing process.

In our efforts to shape and sharpen our students' verbal skills, to expand their knowledge of literature, and to add to their general intellectual growth, we provide memorable and useful experiences. Such is our ambition: that our efforts and associations will instill habits and skills of lifelong value.

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**Graduation Requirements:  
4 Years**

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## ENGLISH I

### Form III

This course seeks to ground students in the essential elements of effective reading, writing, and speaking. Two major objectives are to teach students to read for meaning and to express themselves clearly and logically through the written word. Writing assignments vary from analytic and personal essays to journal entries and creative exercises. Most assignments emphasize revision and require multiple drafts. Students read and discuss works from many genres and examine how plot, character, theme, and language inform each other. William Golding's *Lord of the Flies*, Lorraine Hansberry's *A Raisin in the Sun*, William Shakespeare's *Macbeth*, excerpts from Julie Otsuka, and short story and poetry selections enhance our students' understanding of the power of language and the richness of human experience. English I also includes a formal study of grammar and usage. In addition to our online subscription to the grammar resource IXL and the workbook text *Into Literature Grammar Practice*, students continue to use *Wordly Wise 3000* for vocabulary study.

## ENGLISH II: WORLD LITERATURE

### Form IV

This course exposes students to many genres of world literature and reinforces boys' understanding of critical terminology. It places special emphasis on close reading and urges students to explore how figurative language, allusion, connotation, and imagery enhance meaning. Students hone these skills through reading Khaled Hosseini's novel *The Kite Runner*, Athol Fugard's play "Master Harold" ... and the boys, and short stories from Gabriel García Márquez, Ha Jin, and Jhumpa Lahiri's *Interpreter of Maladies*. Mohsin Hamid's *The Reluctant Fundamentalist* and

*cont.*

Chinua Achebe's *Things Fall Apart* complete a selection that we hope will challenge and broaden the perspectives of our young men.

Expository essays help students develop analytic and critical skills; personal narrative assignments encourage Fourth Form writers to develop their own voice or rhetorical style. Original poetry, short stories, and frequent print or digital journal entries complement more traditional writing assessments. In order to further their ability to communicate effectively and gracefully, students also continue the study of grammar and vocabulary begun in Third Form, turning their attention to usage and the mechanics of writing. In addition to our online subscription to the grammar and usage resource IXL and the workbook text *Into Literature Grammar Practice*, students continue to use *Wordly Wise 3000* for vocabulary study.

## ENGLISH III: AMERICAN LITERATURE

### Form V

Building upon the grammatical foundation and introduction to literary genres established in Fourth Form, this course offers a selective thematic survey of varieties of the American experience. The course includes selections of poetry, fiction, and essays from authors such as Phillis Wheatley, Frederick Douglass, Walt Whitman, Emily Dickinson, Langston Hughes, and Nella Larsen. Core texts include Tommy Orange's *There There*, Zora Neale Hurston's *Their Eyes Were Watching God*, F. Scott Fitzgerald's *The Great Gatsby*, and August Wilson's *Fences*. Our study of American literary culture serves as the basis for regularly assigned critical papers and personal narratives. Teachers assign a variety of topics, and as the year progresses, students are given greater freedom to choose their topics and their approaches.

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The department expects papers to be thorough, well organized, clearly worded, insightful, well documented, and substantially free of spelling, grammatical, and mechanical errors.

## ENGLISH IV: THE INDIVIDUAL & SOCIETY Form VI

The fall term is devoted to honing skills in close reading and careful writing. Students write daily reflections and commentaries, and, in frequent personal narratives and analytic essays, demonstrate their command of rhetorical devices, their emerging mastery of different writing styles, and their growing skill at editing. Resources like William Zinsser's *On Writing Well* provide accessible and engaging guides for aspiring writers to refine their diction, syntax, and style. Classic and contemporary poetry, creative nonfiction essays, Eleanor Burgess' *The Niceties*, Ta-Nehisi Coates' *Letter to My Son*, and William Shakespeare's *Hamlet* allow students to think deeply about how individuals express their relationships with surrounding social structures.

## ENGLISH IV\*

### Form VI

#### *Prerequisite*

This seminar aims to challenge our most motivated students to become better writers and more attentive readers of literature and the world around them. Readings from a variety of genres fuel close-reading exercises and discussions of modes of realism and topics in philosophy. We also read nonfiction and personal narratives, paying careful attention to these writers' use of language. By imitating these writers in their own personal narratives and analytic essays, students learn to write clearly and creatively, and they gain a greater appreciation for writing as a craft. In the second half of the semester, we use our improved critical reading and writing skills to dive deeply into a study of *Hamlet*, where students develop an awareness of scholarly criticism and learn to engage with secondary sources.

## **ENGLISH IV SPRING SEMINARS**

In the spring, English IV becomes a seminar style topic-centered class based on the college model, in which students assume more responsibility for class discussion and presentation. The department gives students the opportunity to indicate preference of seminars, but sections are formed in the fall at the discretion of the department and depend upon staffing and class-size limits. Recent offerings include the following:

### **ENGLISH IV SPRING SEMINAR: THE MEANING OF LIFE**

Samuel Taylor Coleridge famously stated that poetry is “the best words in the best order,” distinguishing it from prose, which he identified as “words in their best order.” In her poem “Poetry,” Marianne Moore called it “fiddle,” as in ‘a piece of deception’ . . . but then soon admitted that within it is “a place for the genuine.” This course will embrace both of these takes on what poetry is and combine them with the idea that the acts of reading and writing poetry enable us to access things other genres can only bring us up to the edge of. We will attempt to push past the edge by exploring and experimenting with such forms as the sonnet, villanelle, ode, and free verse poem. We will study and play around with line and line breaks, sound devices, and figurative language. We will give voice to what appears on the page. And we will engage in workshopping exercises that help further our craft and build a community of people committed to giving themselves over to the mystery of it all.

### **ENGLISH IV SPRING SEMINAR: PAGE AND STAGE**

After close readings of contemporary and classic plays, students view video performances and attend live performances on Philadelphia stages. We then evaluate the effectiveness of the productions using the critical language of the arts journalist. Whenever possible, we discuss the creative process with writers, directors, designers, and actors.

### **ENGLISH IV SPRING SEMINAR: READING & WRITING POETRY**

Samuel Taylor Coleridge famously stated that poetry is “the best words in the best order,” distinguishing it from prose, which he identified as “words in their best order.” In her poem “Poetry,” Marianne Moore called it “fiddle,” as in ‘a piece of deception’ . . . but then soon admitted that within it is “a place for the genuine.” This course will embrace both of these takes on what poetry is and combine them with the idea that the acts of reading and writing poetry enable us to access things other genres can only bring us up to the edge of. We will attempt to push past the edge by exploring and experimenting with such forms as the sonnet, villanelle, ode, and free verse poem. We will study and play around with line and line breaks, sound devices, and figurative language. We will give voice to what appears on the page. And we will engage in workshopping exercises that help further our craft and build a community of people committed to giving themselves over to the mystery of it all.

### **ENGLISH IV SPRING SEMINAR: SYNTAX & STYLE**

Syntax and Style for the Serious Writer is designed for those students who are interested in going deeper into English grammar and mechanics than they have ever gone before. It is for those who secretly delight in the prospect of breaking out a ruler and—in their neatest possible printing or handwriting—diagramming some sentences. It is for those who inexplicably find comfort, if not pleasure, in considering whether the em dashes in the preceding sentence are the right choice or if commas would be more effective. It is for those who are fascinated by how sentences function and want to gain a deeper understanding of how sentence structure and style are related. In this course, we will be using material from such texts as *Rex Barks*, *Elements of Style*, *Says Who?*, *Warriner's High School Handbook*, and *Biting the Wax Tadpole*, to name a few. We will be reading, writing, discussing, and collectively geeking out, in a safe space, about syntactic minutia, all with the aim of equipping you with knowledge and skills that will enable you to write stronger, more elegant sentences.

### **ENGLISH IV SPRING SEMINAR: ART OF THE SHORT STORY**

Students immerse themselves in a variety of short stories, concentrating on what makes the short fiction genre special. They also craft original pieces of fiction and discuss them in the workshop format. From work by Alice Walker and Truman Capote, to Vladimir Nabokov and Jamel Brinkley, we read a broad selection of fiction offering a range of narrative voices, including contemporary stories.

# Health & Physical Education

The primary goal of the Health and Physical Education curriculum is to provide the boys with the framework necessary to develop and maintain a healthy physical, mental, social and emotional outlook.

## PHYSICAL EDUCATION & WELLNESS

### Form III

This class meets one time per cycle and introduces the boys to a variety of experiences that will form the basis for their adult fitness program. The five components of physical fitness are applied to these activities to give the boys an awareness of the importance of wellness in their lives. The class includes the following concepts:

- Exercise Physiology
- Bioenergetics and Exercise Metabolism
- Sport and Wellness Program Development
- Advanced Nutrition Concepts
- Fundamentals of Biomechanics, Motor Skills
- Program Validity and Reliability
- VO2 Max, Cardiac Output

## HEALTH

### Form IV

This class meets one time per cycle and is devoted to current topics including nutrition, exercise physiology, non-communicable diseases, body systems and designated social/emotional health awareness. The class includes the following concepts:

- Mental, Social and Emotional Health
- Reproductive Systems
- STD'S
- Cancer, Heart Disease and Diabetes
- Drug, Alcohol and Tobacco Abuse
- Anatomy and Physiology
- CPR / First Aid / AED

**Graduation Requirements:  
1 Year During Form III & IV**

# History

The History Department believes that history and social science are at the heart of a strong liberal arts education and, therefore, vital to the development of the essential qualities of a Haverford School graduate. It is through the study of history that a student can understand how the earth and humankind have come to be as they are today and to foresee how the lessons from the past can guide the interactions between peoples and nations in the future. Our core program is two years of global history followed by an in-depth study of United States history; subsequent electives allow students to closely investigate topics of particular interest. Throughout the program, students increase their curiosity, develop their capacity for critical and creative thinking, and expand their openness to new ideas and different ways of experiencing our common humanity.

The Department emphasizes the development of the following attitudes, attributes and skills:

- Read with an inquisitive, critical mind so as to explore material for authenticity and value
- Think critically so as to arrive at well-reasoned conclusions
- Communicate effectively orally and in writing
- Research effectively using both electronic and printed sources
- Apply sound note-taking, memorization, test-taking and other study skills
- Use technology to maximize learning
- Internalize an ethical, moral compass to guide decisions and actions
- Become a life-long student of history

The Department also recognizes the efficaciousness of using collaboration to educate boys by engaging them in major projects that involve research, writing, debating, and oral presentation skills. Among them are the Third Form Archeology Project, the Fourth Form World War I Trials, and the Fifth Form research paper.

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**Graduation Requirements:  
3 Years**

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## ANCIENT WORLD HISTORY

### Form III

This Third Form course is, at its core, an introduction to topics in ancient and classical civilizations. With a strong focus on historical analysis and foundational skills in the freshman year, the course will systematically address: effective reading of texts; note-taking, from both reading and class; writing the analytical essay; research techniques using library tools and methods; interpreting maps and other visual presentations; and making oral presentations, both formal and informal. The format of the course will include seminars, lectures, films/video, project-based learning, and other presentations.

## MODERN WORLD HISTORY

### Form IV

In a survey of world history from the 13th century to the present, this yearlong Fourth Form course will ask two intersecting and complementary questions: what is “modern,” and what processes made/are making the world modern? The course centers on the development and interaction of western and non-western civilizations over this period, examining significant ideas, events, and persons from the multiple perspectives of political, economic, and social history. The students will approach modern world history both chronologically and thematically, using the six themes of (1) interaction between societies, (2) change and continuity over time, (3) technology and demography, (4) social structure, (5) cultural and intellectual developments, and (6) states and political identities. The course uses and refines the academic skills taught in Third Form Ancient History. Debates, historical trials (World War I), research papers, analytical essays, reflections, and oral presentations are among the methodologies used in this course.

## UNITED STATES HISTORY

### Form V

This yearlong Fifth Form course covers the breath of American history from colonization to the present. Political, economic, and diplomatic developments are at the heart of the course, but social and intellectual history is covered as well. The course combines a traditional chronological approach with an emphasis on selected themes and topics including: the development of the United States as a world power; the socioeconomic, racial, and ethnic diversity of American society; the development of the American political tradition (sectionalism, citizenship); and the role of government in the regulation of the economy. Readings include narrative history, news articles, primary sources, and other supplementary materials.

## UNITED STATES HISTORY\*

### Form V

#### *Prerequisite*

This is an advanced version of the classic survey course in United States History. The course provides a foundation for a sophisticated appreciation of the history of the United States, beginning with the settlement of the colonies and ending with the present day. Events are studied within the historical contexts of chronology and geography. Students will acquire a critical lens for the understanding of contemporary issues, such as the tension among liberty, equality, and justice. College-level texts, advanced work with primary and secondary sources, and work in historiography are hallmarks of the course.

## HISTORY ELECTIVES

The History Department offers single semester electives for Form VI and V. Electives vary from year to year and are subject to change based on student interest during the course request process, however recent offerings include the following:

## AFRICAN AMERICAN STUDIES (F)

### Form VI & V

In the course, we consider African-descended people's social, political, economic, and cultural experiences in the United States. It introduces the fiercely contested journey from the margins to the center of intellectual discourse, which is critical to provide a framework to understand the revival of civil rights. Particular attention will be paid to the development and evolution of the field of African American history, using race, class, gender, sexuality, and religion as essential categories of analysis. We will use student experiences to frame historical contexts of colonial independence, plantation and Antebellum South, Reconstruction, the Nadir period, the Civil Rights era, and the Cold War. Some questions to be tackled include: Are racial and gendered exclusions of African Americans wired into America's historical legacies and present-day practices? What problems are posed by under-privileging African American history?

## **CONTEMPORARY INTERNATIONAL RELATIONS (S)**

### **Form VI & V**

The 21st century has been characterized by rapid change and increasing globalization, impacting individuals in societies in unprecedented ways and creating complex global political challenges. This one semester survey course explores the intricacies of how global leaders in the international community must balance past interactions and future projections while making present choices. Using specific case studies and current events, as well as participating in a semester-long online simulation while competing for class credit, students will confront IR concepts in real time. Topics will include different political theories, decision making, the role of international organizations, and major geopolitical moments that have shaped the current world order.

## **EUROPEAN DICTATORS\* (F)**

### **Form VI**

#### *Prerequisite*

This is a one-semester advanced course for Sixth Form students. It will focus on 20th century Europe between the world wars with special attention to the rise of totalitarianism and the conditions and events that paved the way to power for Benito Mussolini in Italy, Joseph Stalin in the USSR, Adolph Hitler in Germany, and Francisco Franco in Spain. In addition to traditional history books such as *European Dictatorships: 1918-1945*, we will make use of memoirs such as Orwell's *Homage to Catalonia*, Levi's *Christ Stopped at Eboli*, Solzhenitsyn's *One Day in the Life of Ivan Denisovich*, Picasso's *Guernica*, and films like the Christopher Isherwood-inspired *Cabaret* and Leni Riefenstahl's classic and chilling documentary *Triumph of the Will*.

## **GLOBAL FINANCIAL MARKETS (F & S)**

### **Form VI & V**

Global Financial Markets and Investments will provide students with a firm understanding of the concepts and practices associated with making sound investments and navigating financial decisions in adulthood. We will contemplate topics such as world markets and related indices, financial statements, financial instruments, personal finance, financial institutions, and financial crises of the past and present. On a weekly basis, students will also evaluate particular current events and examine the positive or negative results on stock price and the broader economy.

## **GOVERNMENT & POLITICS (S)**

### **Form VI & V**

This course will present an introduction to the study of government and politics and will prepare students to become active and engaged citizens. Our studies will begin with the many forces that influenced the writing of the United States Constitution. From there, we will learn about the organization of the federal government, including the political, media, and electoral forces that dictate its behavior, before discussing various issues arising from current demographic, economic, and political trends. Throughout, the course will also focus broadly on current events and deeply on certain issues of immediate import. This course will make use of news organizations, periodicals, political scientists, and various data journalism experts and will culminate in a final research project.

## **HISTORY OF SCIENCE, SEX, & CULTURE\* (F & S)**

### **Form VI**

#### *Prerequisite*

This course will focus on issues of gender and sexuality from the late 19th century to the present. With particular

*cont.*

attention to how science has transformed understandings of human sexuality, reproduction, and sexual difference, we will consider such questions as: How have biological understandings of male and female bodies changed? How did wars and epidemics change the stakes of sex for families, nations, and medicine? How did race, class, religion, and age inflect discussions about masculinity, femininity, and sex? Topics will include the history of eugenics, public health programs, social movements (i.e. Civil Rights, Women's Rights, Disability Rights, LGBTQ), "the pill", prostitution, Men's health, regulation of pornography, and assisted reproduction.

## **HISTORY OF SPORT (S)**

### **Form VI & V**

This course will explore the historical development of sport from ancient times to the present. We will investigate sport as a site in which issues of nationalism, race, class, gender and sexuality were reinforced and also challenged. While the scope of the course is broad, it will primarily focus on key debates and turning points of Western sport in the 19th-21st centuries. Topics will include: violence and sport, sports activism, amateurism vs. professionalism, youth sports pipelines, commercialization of sport, Title IX, performance enhancement and its regulation, and evolving athletic technologies (from the artificial limb to Nike Vaporfly shoes). Beyond reading secondary literature, analyzing primary documents, watching documentary films, and participating in discussions and small projects, each student will also lead a class discussion and perform original research and writing (or create a final multimedia project) on a topic of their choice.

## **SOCIAL PSYCHOLOGY (F & S)**

### **Form VI & V**

This course for Fifth and Sixth Form students examines the principles of social psychology: that is, how individuals think, feel, and behave in regard to other people and how individuals' thoughts, feelings, and behaviors are affected by others. The course will concentrate on the process of social thinking, such as motivation, leadership, conformity, obedience and persuasion, and social relations, including aggression, altruism, prejudice and attraction. General principles of coping, grouping identities, and social stress will be discussed. In addition to readings from the text, the course will include discussions of "case studies," film presentations and journal writing

## **THE GLOBAL SOUTH: A HISTORY OF HUMAN RIGHTS\* (S)**

### **Form VI**

#### *Prerequisite*

On December 10, 1948, 56 members of the newly created United Nations voted to adopt the Universal Declaration of Human Rights, creating an international framework that recognized "the inherent dignity and the equal and inalienable rights of all members of the human family." Students will examine recent and seminal historiography on the development and experiences of Africans, South Asians, and Latin Americans, often referred to as the Global South. Students will analyze and evaluate major historical questions on the origins, evolution, and institutionalization of the Global South and its culture. Synthesizing primary and secondary sources across communities in Africa, Asia, and Latin America students will evaluate the effectiveness of the political, social, and economic ideologies and institutions in the struggle to attain full and equal global citizenship.

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Other concepts include the international division of labor, demand for raw materials, economic development and underdevelopment, and economic independence. This course traces the global history that led to the 1948 Declaration and introduces students to the recent historiography of the Global South and human rights, a field that has emerged over the past twenty years.

## **THE CIVIL WAR ERA\* (F)**

### **Form VI**

#### *Prerequisite*

This one-semester advanced course for Sixth Form students will cover the military, political, economic, social, and cultural dimensions of the Civil War era of roughly 1820-1876. This course will focus on helping students improve their reading, writing, and discussion skills and will feature several creative projects. Our readings will be a mix of primary sources and selections from important secondary sources such as: *Fateful Lighting: A New History of the Civil War & Reconstruction* by Guelzo; *The American Civil War: A Military History* by Keegan; *Been in the Storm So Long: The Aftermath of Slavery* by Litwack; and *Divided Houses: Gender and the Civil War* by Clinton & Silber.

# Mathematics

The Upper School mathematics program sets forth clear, high-quality academic benchmarks that all students must master by the end of each course. These are designed to exceed the Pennsylvania Common Core Standards in their respective subjects. The Haverford School's expectations are rigorous, relevant to the real world, and reflect the knowledge and skills our graduates will need to be well prepared for the mathematical challenges in life beyond Haverford.

Each of our courses offers a comprehensive set of learning objectives with the common goal of developing competent problem solvers, effective communicators, independent learners, and confident critical thinkers; these are skills that extend beyond mathematics. We are committed on an ongoing basis to improving the mathematics offerings available to our students. To that end, our instruction and curricula are monitored and adjusted to best serve our charges – the future global citizens of the 21st Century.

## Mathematics Course Progression

FORM II	FORM III	FORM IV	FORM V	FORM VI
PreAlgebra	Algebra I	Geometry	Algebra II	PreCalculus
Algebra I	Geometry	Algebra II	PreCalculus	Calculus, and/or Statistics/*
Algebra I	Geometry*	Algebra II*	PreCalculus*	Calculus*, or Statistics*
Geometry	Algebra II	PreCalculus	Calculus	Calculus*, or Statistics/*
Geometry	Algebra II*	PreCalculus*	Calculus*	Calculus II*, and/or Statistics/*

**Graduation Requirements:  
3 Years Through PreCalculus**

## ABOUT ALGEBRA I & GEOMETRY

Algebra is important as a modeling and problem solving tool, and it bridges the gap from computational mathematics to abstract understanding. Geometry introduces the spatial relationships that exist in two and three dimensions. The concepts learned in these introductory courses are used by each of us every day - albeit unconsciously - and form the foundation upon which subsequent math courses are built.

### ALGEBRA I

Algebra I is an introductory course designed for incoming Third Formers who have had little or no algebra or who need a thorough review of basic algebra. The topics explored during the school year consist of:

- Problem solving skills
- Variables and proportions
- Linear graphs and equations
- Multiple representations of linear situations
- Multiplications of algebraic expressions
- Solving systems of linear equations
- Quadratics, including factoring expressions, graphing functions, and solving equations
- Solving and graphing linear inequalities
- Simplifying rational expressions
- Using laws of exponents
- Using function notation
- Appropriate use of a graphing calculator for the topics listed above

### GEOMETRY

This course provides a comprehensive introduction to Euclidean geometry. A solid foundation in Algebra I is required. The topics to be covered will include:

- Foundations of geometry
- Polygons
- Circles
- Coordinate geometry with transformations
- Inductive and deductive reasoning
- Mathematical proof
- Congruence and similarity
- Area and volume

### GEOMETRY\*

This course provides a thorough year-long study of Euclidean geometry at an advanced level for qualified students from Third and Fourth Form. The course includes all of the foundational components of the standard course. Students will also be expected to connect concepts, and the most successful students will solve problems creatively. A mastery level understanding of Algebra I and a teacher recommendation are required to register for the course. In particular, the topics to be covered will include (but not necessarily to be limited to) the following:

- A rigorous treatment of mathematical proof
- Justification of the major theorems of the course
- Vectors
- Circle theorems

## ABOUT ALGEBRA II

The Haverford School offers two levels of Algebra II - Honors and Standard. The goal of each is to expand and deepen your existing knowledge of Algebra I and Geometry; both courses emphasize the computational and theoretical components of the subject matter. Successful completion of these courses will satisfy the Common Core requirements for Algebra (as set by the Pennsylvania Department of Education) and will prepare students to tackle more advanced coursework in the future.

### ALGEBRA II

#### *Prerequisite*

This yearlong, standard level course is intended to meet (and surpass) the Common Core requirements. This is an exhaustive curriculum with particular emphasis on the practical/computational components of the subject and on the use of functions as mathematical models for solving real-world problems. In particular, the topics to be covered will include (but not necessarily limited to) the following:

- Properties of sets of numbers and number systems
- Solving equations, inequalities, and absolute value problems
- Functions, relations, and their graphs
- Combinations and transformations of functions
- Inverse relations and functions
- Linear functions and systems of linear equations
- Quadratic functions and introduction to complex numbers
- Properties of higher-order polynomials

*cont.*

- Radical functions and rational exponents (roots and powers)
- Exponential and logarithmic functions
- Rational functions
- Functions as mathematical models
- Elementary probability

## **ALGEBRA II\***

*Prerequisite*

This yearlong course covers the topics outlined above, but in a much more rigorous fashion. There are a number of additional topics presented as well. One of the distinguishing features of this course over its standard counterpart is the greater commitment in both time and effort required for success. This course delves much deeper into the theory behind the basics and contemplates a wider range of topics. The curriculum reaches well beyond the Common Core requirements and prepares the students to tackle Precalculus at the honors level the following year. In particular, the topics to be covered will include (but not necessarily to be limited to) the following:

- Domain and range of functions and their inverses
- Systems of inequalities and absolute value equations
- Families of functions; transformations and graphs; end behavior of functions
- Quadratic equations (using advanced factoring techniques)
- Complex numbers/operations
- Systems of quadratic equations/inequalities
- Exponential and logarithmic functions using  $e$  and change of base
- Rational functions and their graphs – asymptotes, discontinuities, intercepts, roots and end behavior
- Conic sections – transformations and graphs
- Functions as mathematical models (using technology/software to solve real-world problems)

## **ABOUT PRECALCULUS**

Precalculus builds on the concepts from Algebra and Geometry to create the foundation for the study of calculus and is offered in Standard and Honors levels. This challenging course includes an examination of many types of functions including trigonometric, exponential, logarithmic, rational, quadratic, and higher - order polynomials. Students will be challenged to examine mathematics graphically, algebraically, verbally and numerically. The use of the graphing calculator will be required in this course, and students will be expected to know the five basic graphical functions: minimum, maximum, value, zero, and intersection.

## **PRECALCULUS**

*Prerequisite*

This course provides a comprehensive preparation for the study of calculus at Haverford or an introductory calculus course in college. This course requires a strong working knowledge of all the material from Algebra II, i.e. of linear, quadratic, higher-order polynomial, rational, exponential, and logarithmic functions. The concepts of trigonometry, sequences and series, and combinatorics will be developed. Mathematical models - solving real-world problems - requiring both algebraic and numerical methods will be emphasized throughout.

## **PRECALCULUS\***

*Prerequisite*

This course covers all of the topics in Standard Precalculus with additional and/or enhanced coverage of conic sections, parametric equations, polar coordinates, vectors and the complex plane. Honors Precalculus is fast paced and requires a mastery of all previously studied skills. Connections with the sciences, economics and other real-world applications are developed throughout. This course will also develop the student's skills in the use of the graphing calculator, in all of its modes. In particular, the topics to be covered will include (but not necessarily to be limited to) the following:

- Advanced trigonometric functions - graphs of tangent, cotangent, secant, cosecant and their inverses; half-angle formulas, product-to-sum formulas
- Advanced applications of conic sections - working from first principles, i.e. definitions of foci, directrices and eccentricity
- Parametric equations - graphs and applications
- Polar coordinates and graphing polar equations
- Vectors and vector operations in 2 and 3 dimensions - dot and cross product, components of vectors, lines and planes in 3-space
- Complex numbers - trigonometric form, De Moivre's Theorem
- Advanced treatment of sequences and series - tests for convergence of infinite series, mathematical induction
- Introduction to calculus - limits, continuity, tangent line to a curve

## ABOUT CALCULUS

Inspired by problems in celestial mechanics, Newton and Leibniz developed the ideas of calculus more than 300 years ago. Since then, each century has extended the power of calculus to illuminate questions in mathematics, the physical sciences, engineering, and the social and biological sciences. Calculus is a powerful tool for reducing complicated problems to manageable procedures. The Haverford School offers two levels of calculus: Standard and Honors. The goal of both courses is to provide students with a clear understanding of the ideas of calculus as well as provide a solid foundation for subsequent courses. Both courses require a strong working knowledge of material from Algebra II and Precalculus, the ability to work independently, and include both computational and theoretical components.

## CALCULUS

### *Prerequisite*

Calculus begins with a brief review of functions including logarithmic, exponential and trigonometric. After developing the ideas of limits and continuity, the course will focus on the major concepts of differential and integral calculus. Students will learn methods for taking derivatives and antiderivatives and use these methods in various applications. Although not as theoretical as Calculus I\*, this course requires a strong working knowledge of previous courses, the ability to work independently, and a desire to learn higher mathematics.

*cont.*

The students will use the graphing calculator as well as various online resources. In particular, the topics to be covered will include (but not necessarily limited to) the following:

- Limits of functions-- graphically and algebraically
- Definition of derivative-- instantaneous vs. average rate of change; slope and equation of the tangent line
- Differentiation techniques-- polynomials, trigonometric, and transcendental functions; implicit differentiation
- Applications of derivatives-- displacement, velocity, and acceleration; optimization; related rates
- Integration-- Riemann sums, definite and indefinite integrals, u-substitution
- Applications of integration-- area under and between curves; accumulation

## CALCULUS\*

### *Prerequisite*

This course is a thorough and challenging development of differential and integral calculus. In addition to numerous applications, this course includes a theoretical component and advanced methods of differentiation and integration that will not be covered in Standard Calculus. This course will prepare students to take Calculus II\* at THS or move into a more theoretical calculus course in college, such as those required for mathematics, engineering or applied science majors. It is anticipated that students, having successfully completed Calculus I\*, may successfully sit for the Calculus AB Examination in the spring. In particular, the topics to be covered will include (but not necessarily to be limited to) the following:

*cont.*

The students will use the graphing calculator as well as various online resources. In particular, the topics to be covered will include (but not necessarily limited to) the following:

- Limits of functions-- graphically and algebraically
- Definition of derivative-- instantaneous vs. average rate of change; slope and equation of the tangent line
- Differentiation techniques-- polynomials, trigonometric, and transcendental functions; implicit differentiation
- Applications of derivatives-- displacement, velocity, and acceleration; optimization; related rates
- Integration-- Riemann sums, definite and indefinite integrals, u-substitution
- Applications of integration-- area under and between curves; accumulation

## CALCULUS II\*

### *Prerequisite*

This is a rigorous and fast paced one semester course which builds on the foundation of Calculus I\*. Topics covered include applications of differential equation to physics, engineering, and biology, infinite series, parametric and polar representation, and the foundations of vector calculus. It is anticipated that students, having successfully completed Calculus II\*, may successfully sit for the Calculus BC Examination in the spring. In particular, the topics to be covered will include (but not necessarily to be limited to) the following:

- Differential equations--separable equations, slope fields, Euler's Method, first-order equations and integrating factors

*cont.*

- Sequences and series--limits of sequences, numerical series, power series, Taylor series
- Parametrically defined curves - slope and arc length
- Polar curves--slope and area in polar coordinates  $x\theta$  ■ Vector-valued functions--position, velocity, and acceleration in the plane

## **MATH ELECTIVES**

The Mathematics Department has an offering of electives available to Form VI, V, IV based on a student's interest and desire to pursue a specific topic outside of core math courses. Most electives have a prerequisite and require the recommendation of the student's current teacher. Electives that have been offered in the past include:

## **ADVANCED COMPUTER SCIENCE\***

**Form VI & V**

*Prerequisite*

This full-year course, intended for students with experience or interest in computer programming, offers the opportunity to deep-dive into programming concepts through a collaborative, project-based approach. This curriculum immerses students in Java programming topics (abstraction, algorithms, data structures, object-oriented programming, etc.) and prepares students for college coursework and potential careers in computer science. As they progress through the year, students will solve unique, real-world problems of increasing complexity to further hone and practice their programming skills. Depending on the schedule modality, major units/projects will include:

*cont.*

- Introductions (Avatar Creator Project)
- Primitive Control (Resource Finder Project)
- Strings and Iteration (Language Interpreter Project)
- Objects, Classes, and Methods (Disease Diagnoser Project)
- Arrays, ArrayLists, and 2D Arrays (Air Quality Analyzer Project)
- Inheritance (Hospital Locator Project)
- Searching, Sorting, and Recursion (Data Decoder Project)

## **ECONOMICS: MACRO\* (F)**

**Form VI & V**

*Prerequisite*

This conceptually challenging elective covers the main ideas of macroeconomics, the study of the largescale structure of the national and world economy. The mathematical level is comparable to that of an introductory college class in macroeconomics. Topics include national income accounting (GDP), economic growth, unemployment and inflation, the financial sector, money and banking, aggregate supply and demand, fiscal and monetary policy, and international finance.

## **ECONOMICS: MICRO\* (S)**

**Form VI & V**

*Prerequisite*

This mathematically demanding elective covers the main ideas of microeconomics, the study of the decision-making processes of consumers and producers in a market economy. The mathematical level is comparable to that of an introductory college class in microeconomics. Topics include market equilibrium, elasticity, taxes and price controls, international trade, consumer and producer decisions, competition and monopoly, and externalities, such as pollution and global climate change.

## **FINANCE: FINANCIAL LITERACY (F & S)**

**Form VI & V**

*Prerequisite*

This course is designed to introduce the student to basic financial literacy skills to help them make responsible financial decisions. Concepts covered include financial planning, bank accounts, credit and loans, wages and taxes, investments, and insurance. Students will gain the information and skills to implement a life-long plan for financial success. A major goal of the course will be to teach students effective problem-solving techniques using real world transactions, mathematical reasoning, and spreadsheet modeling.

## **INTRODUCTION TO COMPUTER SCIENCE**

**Form VI, V, IV**

*Prerequisite*

This yearlong course offers an introduction to computational thinking and programming skills through collaborative, open-ended authentic, and collaborative projects. Students will spend time examining how computing shapes society by investigating and debating issues such as cybersecurity, data privacy, and digital literacy. The course will also explore introductory programming concepts, first through blockbased

*cont.*

coding and eventually working towards text-based (Python or equivalent). Students will leave this course with an overarching understanding of computer science principles and prepare for further coursework if desired. Depending on the schedule modality, major units/projects will include:

- Algorithmic Thinking (Password Generator Project)
- Programming (Scratch Programming Project)
- Data Representation (Unintend'o Controler Project)
- Digital Media Processing (Image Filter Project)
- Big Data (TEDxKinda Project)
- Innovative Technologies (Prototyping the Future Project)

## **LOGIC (S)**

### **Form VI & V**

#### *Prerequisite*

This semester-long course introduces students to methods of reasoning, inference, and argument. It is open to all students who wish to improve their abilities to think carefully and critically with respect to any claim with which they are confronted, whether that be claims of societal significance such as those pertaining to civic, economic, or political outcomes, or of cultural aesthetics such as those pertaining to art, food, and sports. Not only will students have the opportunity to develop and practice their analytical thinking skills, but they will also develop their understanding of the concepts, systems, and processes of logic and their metacognitive awareness of thought patterns and habits (both their own and others). Students will find many parallels between the methods developed in this course and the equation solving processes of Algebra and the proof processes of Geometry, as well the use of formal abstract language to generalize arguments and derive structure from

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repeated patterns. More specifically, students will learn the foundational principles of proof techniques that they may have seen in their core math courses such as Proof by Induction and Proof by Contradiction. In particular, students will learn to:

- contrast the nature of arguments from that of explanations, opinions, and beliefs,
- understand the principles of deduction vs induction including the conditions of validity and soundness identify and define logical fallacies
- make claims of equivalence and inference based categorical propositions and class using tools such as Venn Diagrams and the Boolean Square of Opposition
- apply the language of symbolic logic in formal proofs of validity

## **MATH MODELING (F)**

### **Form VI & V**

#### *Prerequisite*

This semester-long course introduces students to the concepts and techniques of mathematical modeling. The course is designed to answer the fundamental question, "How can I use mathematics to better understand and solve real-world social challenges?" The course draws from skills students have acquired across all of their math experiences including those in Algebra, Trigonometry, Statistics, and some ideas of Calculus, though students need only have a strong working knowledge of material from Algebra II, more broadly:

- state and build from valid assumptions,
- target desired outcomes and define variables,
- use mathematical techniques to find solutions,
- analyze and model results,
- report conclusions and use the evidence they have acquired to argue compellingly a position

*cont.*

The course will address real-world social challenges such as housing disparities, food insecurity, educational outcomes, and equitable resource distribution

## **STATISTICS**

### **Form VI & V**

#### *Prerequisite*

This yearlong course is intended to provide students a framework to think about the world "statistically." Real world problems will be solved using 21st century methodologies, i.e. by incorporating useful technologies and working collaboratively; the process will be project-based, highly interactive, and engaging. It is ideally suited for students who have completed FST or Precalculus and are now looking to expand their mathematical horizons. The course utilizes an online textbook for readings and exercises.

## **STATISTICS\***

### **Form VI & V**

#### *Prerequisite*

This is a yearlong comprehensive survey of the foundations of probability theory and statistical methods for collecting, organizing, displaying, analyzing and drawing conclusions from data. Emphasis is placed on clear and accurate reporting of the results obtained from these activities. Statistics\* is a demanding course (both in time commitment and complexity), open to qualified Fifth or Sixth Form students who wish to study statistics at a level comparable to a rigorous college course. It is anticipated that students, having successfully completed Statistics\*, may successfully sit for the AP Examination in the spring. Technology will be used extensively for solving problems in the course. No specific textbook shall be required (although classroom copies of Stats: Modeling the World by: Bock, Velleman & De Veaux will be available for reference). Students may take this course concurrently with Calculus

## ADVANCED TOPICS IN MATH\* (S)

### Form VI & V

#### *Prerequisite*

In this semester course we will explore either the foundations of linear algebra or multivariable calculus. The course will alternate topics each year to allow advanced Form V students to take the course two years in a row. This is this highest level mathematics course offered at Haverford and students who enroll should be prepared for rigorous and challenging study.

#### Linear Algebra (Odd Numbered Years)

- Linear Combinations of Vectors
- Basic vector operations
- Matrix operations and their use in solving linear systems of equations
- Vector Spaces and Subspaces
- Orthogonality
- Determinants of Vectors

#### Multivariable Calculus (Even Numbered Years)

- Functions of multiple variables
- Partial differentiation
- The gradient and directional derivative
- Vector Analysis
- Applications from physics, economics, and engineering

# Modern & Classical Languages

The Modern and Classical Languages Department prepares boys to be leaders and citizens in their local, national, and global communities, where a command of multiple languages is not simply beneficial, but necessary. Our faculty engages students using traditional and modern methodologies rooted in the following interconnected principles:

**Cross-cultural engagement and empathy:** Learning a new language affords students the unique opportunity to gain perspective on cultures that differ in place and time. Simultaneously, understanding another language and culture encourages them to reflect on and better appreciate their own. Our collaborative program motivates boys to be open, inclusive, and empathetic.

**Language acquisition:** We aspire towards boys achieving proficiency in listening, speaking, reading, and writing in their respective languages while reaching the rigorous linguistic standards that we uphold. Our faculty fosters cross-cultural communication, inspires intellectual risk-taking, and instills confidence in students to navigate unfamiliar discourse.

**Authentic experience:** Our classes contextualize language study by incorporating meaningful and authentic resources. We value and intentionally provide immersive experiences that align with our curriculum and partner with the Global Studies program for students to connect with communities locally and abroad.

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**Graduation Requirements:  
2 Consecutive Years**

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## **ABOUT CHINESE**

Communicative language skills are the foundation of our Chinese program. By emphasizing listening and speaking followed by reading and writing, students accumulate common words and phrases quickly at the introductory level. Thematic units that emphasize real-life situations, such as ordering food, traveling, or making plans with friends, help students develop skills they can use immediately, as well as build a foundation to continue their studies in college and beyond.

### **CHINESE I**

This introductory course is offered to students with little or no prior experience in Mandarin Chinese. Basic background information of the language such as tones, pinyin, and characters will be introduced. Vocabulary, grammatical structures, and cultural references will be taught and discussed at an elementary level. Students will learn to read simple passages and write in simplified and/or traditional Chinese characters. Throughout the year students will engage in basic communicative tasks related to daily settings.

### **CHINESE II**

#### *Prerequisite*

This course helps students reinforce what they have acquired in Chinese I and continue to expand their skills in listening, speaking, reading, and writing, by studying a variety of texts covering different aspects of daily life, simple academic subjects, cultural settings, and limited written expressions. After finishing the course, students are to be able to communicate

*cont.*

more comfortably and confidently on simple daily and academic subjects and to have acquired a solid reading and writing knowledge to get ready for studying semi-authentic and authentic Chinese texts at advanced levels.

### **CHINESE III**

#### *Prerequisite*

This course continues to build on skills, comprehension, and proficiency developed previously in Chinese II. Students will participate collaboratively in guided conversations and presentations in both written and oral formats. The themes will be focused on daily-life topics throughout the year. They will develop strategies and language skills to talk about themselves and communicate with others on familiar topics in intercultural situations where Mandarin is used.

### **CHINESE III\***

#### *Prerequisite*

This Chinese III\* class offers the same curriculum as the standard Chinese III class but is tailored for high-achieving students. The teachers design instruction and assessment with the expectation that students need little remediation in these areas. Students will be expected to communicate in greater depth.

### **CHINESE IV**

#### *Prerequisite*

This class is designed for students who have successfully completed Chinese III or III\*. In addition to reviewing previously learned vocabulary and grammatical patterns, students will learn new ways to express themselves in Chinese. The main goal of the course is to improve students' levels of communicative competence in listening, speaking, reading, and writing in modern Chinese. By the end of the course, students will attain approximately the Intermediate-mid level on the ACTFL proficiency scale.

### **CHINESE IV\***

#### *Prerequisite*

This Chinese IV\* class offers the same curriculum as the standard Chinese IV class but is tailored for high-achieving students. Teachers design instruction and assessment with the expectation that students need little remediation in these areas. Students will be expected to communicate in greater depth.

### **CHINESE V**

#### *Prerequisite*

This class is designed for students who have successfully completed Chinese IV. This advanced course helps students refine their Mandarin Chinese listening, speaking, reading, and writing proficiency. Students will use authentic materials such as short stories and modern media to develop their communicative competence. Classroom activities emphasize collaborative discussions, presentations, and writing assignments. Additionally, students engage in meaningful cultural exploration to deepen their understanding of Chinese-speaking communities, aligning with the program's goals of fostering cross-cultural empathy and global citizenship.

### **CHINESE V\***

#### *Prerequisite*

Chinese V\* offers an intensive exploration of advanced Mandarin Chinese. This course is designed for highly motivated students seeking to elevate their listening, speaking, reading, and writing proficiency. Students will critically engage with themes through essays, discussions, debates, and multimedia projects. With an emphasis on intellectual risk-taking and nuanced communication, the course prepares students for advanced academic pursuits in Chinese. Honors students are held to a higher standard of performance and independence, progressing accelerated with a focus on cultural and linguistic fluency.

## **ABOUT LATIN**

The study of Latin at Haverford centers on the literature, history, and culture of the ancient Greek and Roman worlds. After learning the key vocabulary and grammatical structures of Latin, students move on to experience a set of classical texts that have shaped Western culture, and continue to shape our world today

### **LATIN I**

This class is designed to introduce students with little or no prior experience with Latin to the language and culture of the Roman world. Students learn the fundamentals of Latin grammar and syntax and begin to build their Latin vocabulary with emphasis on the words that English derives from Latin. Students also study the mythology, history, and culture of the classical world in order to broaden their appreciation of the foundations of Western civilization.

### **LATIN II**

#### *Prerequisite*

This course, offered to students who have completed Latin I in the Middle or Upper School, reviews the fundamentals of Latin I and introduces more sophisticated grammatical concepts requisite for success at the intermediate level. To introduce the art of translation, fables and mythological stories are read, as well as adapted selections from ancient literature. Emphasis is placed on precise analysis and expression in preparation for reading the original works of the Latin writers in Latin III.

### **LATIN II\***

#### *Prerequisite*

Students who choose this course should be especially eager to continue their study of Latin and classical literature. While including the elements described for Latin II, the pace and depth of the curriculum are aggressive and presume an avid enthusiasm for scholarship. Students will complete the fundamentals of Latin grammar while reading and translating a significant body of Latin literature. In addition, students will study the history and culture of ancient Rome in depth, using archaeological and epigraphic as well as literary sources.

### **LATIN III**

In this course, students bridge their study of Latin grammar and syntax with reading authentic Roman texts. Students examine ancient Roman history, mythology, and culture while continuing to build their Latin vocabulary and mastering sophisticated grammatical concepts. The semester will culminate in reading the works of Julius Caesar and examining their historical context.

### **LATIN III\***

#### *Prerequisite*

This course allows the student to apply his knowledge of Latin grammar, syntax and vocabulary to the reading, translating, analyzing and understanding of Latin literature from the late Republic. Particular emphasis will be placed on the works of Caesar and Cicero. In conjunction with our translations, students will study the literary, cultural, intellectual and historical contributions of the ancient Roman world. This course proceeds at an enhanced pace and depth.

### **LATIN IV**

#### *Prerequisite*

Students study the traditions of ancient epic by reading the Iliad, its ancient Latin translation, the Ilias Latina, and Vergil's epic poem the Aeneid. They will read selections of the original Latin and examine and discuss the entire works in English. In addition to mastering Latin epic meter, students will become familiar with Latin poetic style and its place in the history of literature. Through extensive reading, translation, and textual analysis, students develop their confidence in reading at sight and, by writing short papers and giving oral reports on relevant topics, enhance their appreciation of poetic artistry.

### **LATIN IV\***

#### *Prerequisite*

Students study Vergil's epic poem the Aeneid in its historical setting as well as in its place within the traditions of the epic genre. They read extensive selections in Latin, while examining and discussing the entire work in English. In addition to mastering Latin epic meter, students become familiar with figures of speech and Vergil's unparalleled poetic style. Through extensive reading, translation and textual analysis, students develop their confidence in reading at sight and, by writing short papers and giving oral reports on relevant topics, enhance their appreciation of Vergil's artistry. This course, in comparison with the Latin IV course, proceeds at a greatly enhanced pace and depth.

## **LATIN V: PROSE\* (F)**

### *Prerequisite*

In this course students will have the opportunity to read and study a variety of Roman prose writings including history, political commentary, philosophy and letters. The works of authors such as Livy, Tacitus, Suetonius, Caesar, Cicero and/or Pliny will provide the basis for a more thorough understanding of the Roman Republic and Empire. The prose selections will enable students to improve both their reading fluency and literary analysis skills as they gain a better appreciation of Roman culture, history and literature.

## **LATIN V: POETRY\* (S)**

### *Prerequisite*

In this course, students will have the opportunity to read and study a range of Roman poetry including epic, lyric and satire. The works of authors such as Ovid, Catullus, Martial and/or Juvenal will offer the student insights into Roman thinking about politics, love, everyday life, mythology and poetry. The poetry will enable students to improve both their reading fluency and literary analysis skills as they gain a better appreciation of Roman culture, history and literature.

## **ABOUT SPANISH**

The humanity of past and present Spain and the Americas and the study of those cultures undergirds our Spanish program. The students' acquisition of linguistic structures and new vocabulary builds the foundation for future immersion in the target language and growth into level-appropriate literature study, story creation, text analysis, and authentic oral dialogue.

## **SPANISH I**

### *Prerequisite*

This course is designed for the student who has had little or no prior exposure to the Spanish language. It emphasizes the acquisition of fundamental practical vocabulary, a solid foundation in basic grammatical structures, a detailed study of the verb system and the development of sound pronunciation and speaking skills.

## **SPANISH II**

### *Prerequisite*

Students enrolled in this course have successfully completed Haverford's first year of the language or an equivalent course of study. In Spanish II, students will continue to build a solid foundation in the fundamentals of grammar and in the acquisition of a practical, useful, contemporary vocabulary for oral and written communication in a variety of everyday situations. Furthermore, through various cultural explorations, students will continue to expand their knowledge of Hispanic cultures. Students participate in daily oral drills, complete translation exercises, read short passages and write one-page compositions.

### *cont.*

Throughout the year, the students continue to expand their vocabulary and strengthen their precision both in speaking and writing in the past, present, and future.

## **SPANISH II\***

### *Prerequisite*

Students enrolled in this course have successfully completed Haverford's first year of the language or an equivalent course of study, and are prepared for the significantly faster pace of this course. Students in this class will study the future, conditional, imperfect and perfect tenses of the indicative mood, and will also undertake a thorough study of the present subjunctive. The class will be conducted almost entirely in Spanish, and students will be expected to communicate primarily in the target language. Students will engage in oral drills, and translation exercises, and will create presentations and one-page compositions. The class will read and discuss short literary passages and current articles relevant to Hispanic culture.

## **SPANISH III**

### *Prerequisite*

Students enrolled in this course have successfully completed Haverford's Spanish II curriculum. Spanish III begins with a thorough review of grammar covered in the second year. Students will then continue their study of more complex grammatical structures and the Spanish verb system. They will begin to apply their skills to a variety of exercises designed to promote greater fluency in spoken and written Spanish.

### **SPANISH III\***

#### *Prerequisite*

This course is designed for students who have successfully completed Haverford's Spanish II\* curriculum. This third-year course begins with a review of second year skills and introduces appropriate new material to help students improve their command of grammatical structures, vocabulary, and comprehension of both literary and non-literary written Spanish. Short stories, films, and newspaper articles are incorporated into the curriculum, in order to foster greater understanding of Hispanic culture, and to help the student develop the skills necessary to express himself in spoken Spanish. Students in Spanish III\* make the transition from sequential materials used at the previous levels of language instruction to the ability to express themselves creatively in oral and written Spanish.

### **SPANISH IV**

#### *Prerequisite*

The objective of this course is to help the students to convert the linguistic skills acquired during the three previous years into a coherent, clear, and useful means of communication. It prepares students to converse at length and handle everyday situations with confidence. Students view films in Spanish, and read literary works from world-renowned Spanish and Latin American authors. They also use the authentic sources to read about current events in the Spanish speaking world. The films, literary readings and articles are the basis for classroom discussion and provide students with a general understanding and appreciation for the Hispanic culture. By the end of this course the student should have developed

*cont.*

the self-assurance and confidence necessary for using the target language in informal conversations, or before a variety of audiences, ranging from a small circle of friends to a full class.

### **SPANISH IV\***

#### *Prerequisite*

This is an interactive course involving advanced vocabulary and grammatical structure, as well as intensive study and usage of the Spanish language. Students in Spanish IV \* will discuss contemporary news, cultural topics, literary readings, and films in Spanish. The goal of this course is to help students achieve greater fluency, and, as such, it will enable students to communicate with greater confidence, giving them the tools they need to handle day-to-day situations in a contextualized setting.

### **SPANISH V: CINE DEL MUNDO HISPANO (F)**

#### *Prerequisite*

This course addresses themes relevant to the 21st century in the Hispanic world, many of them polemic in nature. Topics include immigration, oppressive government regimes, global responsibility and regionalism versus globalization. Students learn the skill set necessary to watch, understand and interpret Hispanic film and ultimately enabling the students to view films critically and as empathetic global citizens. Advanced grammar and vocabulary will be reinforced through discussion and composition.

### **SPANISH V: CONVERSACION Y CONTROVERSIA (S)**

#### *Prerequisite*

In this semester-long course, students will explore global issues through the literature, art, history, politics, film, and culture of the Spanish-speaking world. Particular emphasis will be placed on developing speaking skills, but students will be required to complete nightly readings in order to participate effectively in class. Readings will be aimed at helping students develop cultural empathy and an understanding of current world events, and will include newspapers, blogs, and other internet sources, as well as literary works. In addition to daily class participation, students will be expected to work individually and in groups on diverse oral projects such as podcasts, presentations and debates.

Additionally, several films will be chosen to complement the themes of the texts explored in class.

### **SPANISH V: LATINOAMERICA EN EL SIGLO XX\***

#### *Prerequisite*

This advanced class will use the literature, art and film of the last century to explore the role of political and economic events in the Spanish-speaking world, in particular the political changes, economic crises and social movements that have influenced and affected in the region. The content of this course will be tailored to student interest and current events. Students will be exposed to the unique voices of short story writers, journalists, poets, artists and filmmakers whose work was informed by these events. Students will also gain insight into the sociopolitical antecedents and repercussions of these critical events.

## **SPANISH V: LITERATURA Y CULTURA LATINOAMERICA\***

### *Prerequisite*

In this course students will explore Latin American culture through literature. The short stories of such authors as Rulfo and Márquez will transform the reader's understanding of the human experience. This advanced course is dedicated to reading and interpreting literature of the Spanish speaking world with particular emphasis on the short narrative.

Immersed in the target language, students will participate actively in discussions and write reflections on literary and social justice topics.

Students will explore the historical, cultural, and literary influence of various authors from all over Latin America and Spain through the 21st century.

# Science

The Haverford School Science Department strives to produce graduates who can synthesize, analyze, and think critically about concepts within the realm of science and across disciplines. We want to develop men who understand that science is an active and ongoing process and emphasize their responsibilities as global citizens, including but not limited to the stewardship of their environment, ethical decision making, and possession of varied perspectives.

We mold active learners who are capable of independent, cooperative, and collaborative work using the available technology and tools. We model and instill personal qualities that will sustain open-mindedness, creativity, imagination, and curiosity. We cultivate persevering, hard-working students who possess the confidence and resiliency to continue their study of science regardless of obstacles they may encounter. Through our courses we hope to nurture and help the boys to sustain the inherent awe, passion, and wonder that science can inspire.

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**Graduation Requirements:  
3 Years**

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## ABOUT PHYSICS

Physics is the fundamental science that allows students to understand the behaviors of matter, motion, and energy. The Haverford student begins his Upper School science journey with an exploration of basic physics, which provides him with the skills and knowledge for future courses in the Science Department. After students complete their core sequence of Physics-Chemistry-Biology, they are encouraged to return to the study of Physics for more focused and mathematically-in-depth examinations. All courses provide students with opportunities for intellectual investigation, tactile experiences, and the development of vital critical thinking and problem-solving skills.

### PHYSICS I Form III

Physics I: is an opportunity for students to learn how to engage in the study of science and develop skills required for success throughout their upper school career and beyond. The course will examine fundamental principles of physics, including energy, motion, and forces. Students will engage in critical science and engineering practices through reading, writing, problem-solving, laboratory investigations, and creative projects, both individually and collaboratively.

### PHYSICS II: APPLIED PHYSICS\* (F & S) Form VI, V

#### *Prerequisite*

Physics II: Applied Laboratory Physics is a one-semester course that provides further exploration of topics from Physics I while introducing a survey of additional topics common to a first-year college physics curriculum, including but not limited to kinematics, dynamics (Newton's Laws), gravitation, energy, momentum, oscillations, electricity, and/or magnetism. Materials will be presented at a fast pace with a strong focus on problem-solving. Students will develop their understanding of physics through both mathematical analysis and laboratory inquiry. Students should expect frequent and challenging assignments as well as intense collaborative project-based experiences.

### PHYSICS II: ASTRONOMY (F) Form VI, V

#### *Prerequisite*

The purpose of this course is to introduce the student to compelling a less familiar with, namely to those areas of our universe that extend beyond our local solar system. We will investigate such areas as cosmology, galactic morphology, stellar evolution, dark matter and energy, evidence for intelligent life beyond our solar system, and the ultimate fate of the universe itself. We will be utilizing one of the more definitive classroom texts about astronomy, Universe by Freedman and Kaufmann. Our discussion will begin with a look at the origin and development of the universe and some of the largest-scale aspects of astronomy, effectively moving backwards through the book.

### PHYSICS I: ELECTRONICS\* (S) Form VI, V

#### *Prerequisite*

This semester-long course provides an introduction to electricity and electronics with a focus on hands-on experience and practical applications. Electronics is one of the fastest expanding fields in research. From the invention of the transistor over seventy years ago to our current reliance on the "Information Superhighway," electronics has been a vital part of our modern technological society. The semester will begin with a look at the evolution of electronics over the last century. This will be followed by a thorough examination of the basic principles: voltage, current, resistance, Ohm's Law, Kirchoff's Law, etc. After a significant amount of time is spent on identifying and understanding how various electronic components work, students will design their own circuits. Using a solder gun and solderless breadboards, students will learn how to build analog circuits that accomplish particular tasks. Later in the semester, students will also have an opportunity to work with integrated circuits. Teamwork, critical thinking, and problem solving will be important attributes. Assessment will be based on tests, homework, and frequent lab reports addressing our various circuit projects.

## **PHYSICS II: THEORETICAL PHYSICS\* (F)**

**Form VI, V**

*Prerequisite*

Physics II\*: Theoretical Physics is a semester-long course that offers a mathematically rigorous exploration of topics from Physics I while introducing a survey of additional topics common to a first-year college physics curriculum, using a strictly mathematical approach that often relies on calculus. Therefore, students will need to be proficient in algebra, trigonometry, and basic calculus. Topics include relativity, linear and circular motion, fluid dynamics, temperature and heat transfer, quantum physics, health physics, and much more. Derivations of notable physics equations will also be frequent as the course is geared to make students comfortable with the language of mathematics as it applies to physics. The course will be conducted at an accelerated pace with a strong focus on problem-solving. Students should expect frequent and challenging class assignments including group collaborations as well as reading and interpreting actual academic papers.

## **ABOUT CHEMISTRY**

Chemistry is the study of matter, its properties, and its interactions. It is the second component of the Upper School science sequence and is integral for a strong scientific foundation. Like Physics, it emphasizes problem-solving strategies, experimentation, teamwork, projects, and the fundamental principles of physical science. To that foundation it adds an understanding of modern theoretical concepts, relationships between structure and function, multi-step calculations, and qualitative and quantitative laboratory work. Chemistry provides students with an understanding of atomic and molecular structure, periodic properties of elements, reactions, stoichiometry, thermochemistry, solution chemistry, acids and bases, and equilibrium. We expect students who have completed a course in chemistry to have a firm grounding in experimental procedures, calculations, basic error analysis, and lab report writing skills. Calculators and computers with related software are frequently used for problem solving and data analysis.

## **CHEMISTRY I**

**Form IV**

*Prerequisite*

This is a broad introduction to, and overview of, the general principles and problem-solving techniques in the study of the composition of substances and the changes these substances undergo. The course focuses on building a solid and thorough foundation of fundamental chemical principles through a project-based curriculum. A high value is placed on students engaging in challenging laboratory and collaborative inclass

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activities. Individual reflection on their experiences is an essential component in support of the acquisition of disciplinary knowledge and skills. In this context, real world phenomena are used to frame student experiences and serve as the basis for the curriculum. Students are assessed both formatively and summatively on classroom participation and content application and mastery with a focus on developing cooperative learning skills. The course touches on all five major branches in chemistry: inorganic, organic, analytical, physical, and biochemical.

## **CHEMISTRY I\***

**Form IV**

*Prerequisite*

This fast moving and very challenging course covers the topics in Chemistry with an added emphasis on more complex and mathematically intense problem-solving techniques and detailed applications to contemporary science and technology. Students are expected to be confident independent learners and have strong organization and study skills. Topics will be explored in more depth and at a faster pace than in Chemistry, and students may explore additional topics in Thermodynamics, Electrochemistry, and/or Reaction Kinetics. Students should expect frequent and challenging out of class assignments.

## **CHEMISTRY II: APPLIED CHEMISTRY\* (F)**

**Form VI, V**

### *Prerequisite*

This course will introduce fundamental concepts of organic chemistry, inorganic chemistry, physical chemistry, analytical chemistry, and/or biochemistry. Students can expect to explore topics in more depth than they experienced in the core Chemistry course. Lab components of the course will introduce students to skills and techniques essential for experimentation in the field of chemistry. Emphasis will be placed on establishing connections to biology, pharmacology, art, and other relevant applications. Understanding will be assessed with quizzes, tests, projects, and/or lab reports.

## **CHEMISTRY II: MATERIALS SCIENCE (S)**

**Form VI, V**

### *Prerequisite*

This course will investigate the world of materials and their profound impact on technology and society. Through a blend of theoretical concepts and hands-on experiments, students will delve into the structure, properties, and applications of various materials, including metals, polymers, ceramics, and composites. Practical explorations of material characterization methods and engineering applications will provide students with a holistic understanding of materials science and its pivotal role in shaping the technological landscape. By the end of the course, students will emerge with a newfound appreciation for the versatility of materials and their transformative potential in diverse industries.

## **ABOUT BIOLOGY**

Biology is the study of living things and the mechanisms that shape their activities, growth, and evolution. It is the last of the science requirements for graduation and takes advantage of the experience students have acquired in their earlier physics and chemistry courses. Each student will gain a thorough knowledge of biological processes that apply to him and grow to have an appreciation for the richness of the natural world around him. Students will learn to think like a biologist by making careful, quantitative observations, asking good questions, forming testable hypotheses, designing and executing laboratory procedures, gathering, analyzing, and presenting cont.

laboratory data, developing scientific arguments, and coming to reasonable conclusions.

Once students complete a Biology I course, myriad opportunities for further study in Biology II are available. All biology courses place emphasis on learning to make informed decisions about biological issues affecting the individual and the community

## **BIOLOGY I**

**Form V**

### *Prerequisite*

Biology focuses on building a solid and thorough foundation of fundamental biological principles such as cell biology, biochemistry, classical and modern genetics, molecular biology, evolution, and ecology through student-centered experiences. A high value is placed on engagement in challenging activities, collaboration with peers, and reflection on experiences, all of which support

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the acquisition of disciplinary knowledge. In this context, more opportunities for scaffolding the student experience and differentiated learning are possible. Students are assessed both formatively and summatively on classroom participation and content application and mastery.

## **BIOLOGY I\***

**Form V**

### *Prerequisite*

Biology I\* is a challenging and fast-paced course that covers the same biological principles as Biology I, but with considerably more depth of information. Students must be able to engage independently with the material and should be comfortable using their textbook and other sources for the acquisition of knowledge. Students must execute laboratory exercises or projects confidently and independently and are expected to incorporate these experiences into their overall understanding without

## **BIOLOGY II: ANATOMY & PHYSIOLOGY (F)**

**Form VI**

### *Prerequisite*

This course examines topics related to the normal functions and components of humans and other living organisms such as body systems, locomotion, internal transportation of materials and/or reproduction. Classroom learning takes advantage of laboratory exercises and dissections to provide opportunities to engage with the topics more deeply. Students should be comfortable using multiple sources of information for the acquisition of knowledge. Student understanding is assessed by tests, laboratories, and projects.

## **BIOLOGY II: BIOLOGY OF SEX (S)**

### **Form VI**

#### *Prerequisite*

This course allows students to extend their study of biology by focusing on a key aspect of life: sex. Students will study reproductive anatomy, the physiology of pregnancy, the genetics of development, cellular mechanisms of contraception, and the epidemiology of sexually transmitted infections

(STIs). The course will also examine the cultural, economic, and environmental factors influencing our understanding of reproductive biology. Through lectures, discussions, case studies, and practical labs, students will gain insights into the complexities of human reproduction and reproductive health.

## **BIOLOGY II: CELLULAR PHYSIOLOGY\* (F)**

### **Form VI**

#### *Prerequisite*

This course examines topics related to cellular functions of the human body focusing on defenses against disease, transmission of information, regulation of body functions, and/or reproduction. Classroom learning takes advantage of laboratory exercises and dissections to provide opportunities to engage with the topics more deeply. Students must be able to engage independently with the material and should be comfortable using multiple sources of information for the acquisition of knowledge. Student understanding is assessed by tests, laboratories, projects, and a research paper.

## **BIOLOGY II: MOLECULAR BIOTECHNOLOGY\* (S)**

### **Form VI**

#### *Prerequisite*

This course is a synthesis of several disciplines: biochemistry, genetics, cell biology, and microbiology. Biologists have the means to analyze the Human Genome. The dissection of the molecular pathway through which

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hereditary information flows between DNA, RNA, and protein molecules adds to our understanding of human development and disease.

Technological developments have provided powerful methods to isolate, analyze, and manipulate DNA, RNA and protein molecules. These developments have transformed biological and medical research. Time will be mostly spent in the lab, learning and using molecular and cell biology research techniques to sequence a gene. Biotechnology will be provided to students, so they can learn theory, practice, and applications with hands-on experimental work. The curriculum may include applications of biotechnology such as genetic engineering, gene therapy, forensic science, and bioinformatics.

## **ENGINEERING: APPLICATIONS (F & S)**

### **Form VI, V**

#### *Prerequisite*

In this course, students will learn what engineering is and the types of projects engineers work on. They will explore the practical process philosophies that a good engineer must use. Through a series of realworld applications, they will investigate the complexities of the decisions faced by engineers and develop the thought processes that guide engineers through these problems. The students will complete team- based projects where they must deliver a product against a series of specifications, on-time, and to-cost. Projects, which may vary year by year, will be based around a definable goal. The projects are rooted in the real world and through them the students will benefit from not only the hands-on engineering experience but also the development of life skills that are the hallmarks of good engineers.

## **ENGINEERING: COMPUTER AIDED DESIGN & MODELING (S)**

### **Form VI, V**

#### *Prerequisite*

This course introduces a variety of computer models used in scientific and engineering industries. Foundational measuring and modeling skills will be taught and used to create blueprints, technical drawings, and 3D printed objects that are appropriately scaled. Models will be used under a variety of different conditions to analyze the physical, structural, thermal, electromechanical, and aerodynamic properties. Knowledge attained in this course will culminate in an independent final project where students examine real-world problems that requires students to create and/or analyze a complex computer model.

## **ENVIRONMENTAL SCIENCE: POLICY AND ETHICS (S)**

### **Form VI**

#### *Prerequisite*

It is of paramount importance that Haverford students understand some of the most pressing environmental challenges that confront their generation in the new millennium. Essential global issues such as water scarcity, peak oil, climate change, and much more will be explored. Local issues in the state of Pennsylvania involving hydraulic fracking and environmental justice will also be discussed. We will take a holistic approach to confronting environmental challenges by not only discussing the scientific factors at play, but the social, moral, political, and economic factors as well. The course will be conducted as a discussion-driven seminar where different points of view are encouraged. Students will be expected to read and interpret policy assessment reports and academic papers, constructively debate their peers, reach out to experts in the field, and collectively seek meaningful solutions.

**ENVIRONMENTAL SCIENCE:  
SYSTEMS THINKING (F)**

**Form VI**

*Prerequisite*

This course explores the fundamental principles of environmental science via a focus on systems thinking. Students will examine core concepts such as sustainability, ecosystem dynamics, and the interconnectedness of environmental processes while considering them through economic, environmental, and social lenses. Through interactive discussions, case studies, and projects, students will develop a holistic understanding of complex environmental issues and the systems-level approaches required for effective solutions.

# The Fine Arts

## Fine Arts Requirement:

In order to graduate, each student must accrue 2 full credits in Fine Arts courses and or Fine Arts Credit Activities:

- Satisfactory completion of a year-long Visual Art, Music, or Theater course equals one full credit.
- Satisfactory completion of a semester-length Visual Art course equals a half credit.
- Satisfactory participation in Notables, String Orchestra, Rock Band, or Jazz Ensemble for one year equals one full Music credit.
- Satisfactory participation for a full year of Stage Crew equals one full Theater Department Fine Arts Credit
- Satisfactory participation in two school dramatic productions as at least an ensemble member equals one full Theater Department Fine Arts Credit

Fine Arts activities that are being used as a sports credit (stage crew or performance ensembles) may NOT simultaneously count for a Fine Arts Credit. Students must announce their intention that their participation will be for credit at the beginning of each activity. Students may combine courses and activities to accrue a total of two years' credit to complete their Fine Arts requirement.

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**Graduation Requirements:  
2 Years**

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# The Performing Arts

## **MUSIC**

Participation in musical study and performance facilitates an appreciation for beauty, a means of self expression, intellectual growth and a forum for positive community activity. We believe that one appreciates most what he understands and that one understands best what he has experienced. The music curriculum is experiential and has as its core musical literacy and artistry. Literacy is not an end unto itself; rather it is an avenue to artistry, understanding and appreciation. The curriculum is structured to prepare our boys for a lifetime of participation in the musical arts as performers or appreciative, well-educated audience members. Students have the option to pursue an intellectual study of music through the study of theory, performance, production, songwriting and history. Students may also pursue performance-based participation in the school's musical ensembles. Performance based study includes options in both vocal and instrumental realms.

## **THEATER**

The purpose of acting, Hamlet tells us, is to hold 'the mirror up to nature.' Students of theater at The Haverford School strive to represent most aspects of human behavior in thoughtful, well-prepared performances both in the classroom and on the Centennial Hall stage. Students are encouraged to understand the world by thinking carefully of their own experience, by inhabiting the skins of others, and by studying classic and contemporary drama. Theater students develop a speaking voice of power and expression. They learn to move with strength and grace. They experience the value of collaboration in large productions including actors, designers, and technicians. They learn to listen to their peers and to carefully critique their work. Most importantly, theatre students develop a physical and emotional confidence to complement their growing intellectual and athletic abilities.

**FUNDAMENTALS OF MUSIC** This is a yearlong introductory level course focused on understanding, reading, writing, and creating music. It is intended for students who want to pursue their passion for music but need help building the fundamental aspects of musicianship such as listening, sight-singing, written/compositional, and analytical skills. While the reading and writing of musical notation will be the first and primary focus, as the course progresses students will proceed to higher level musical tasks such as dictation (rhythmic, melodic and harmonic), keyboard harmony, and composition. Students will be expected to begin their mastery of rhythms in various meters, as well as note identification in multiple clefs in every key signature. Intervals, scales, triads, and seventh chords will be introduced both visually and aurally as well as popular song structures/forms, allowing for both analysis and composition of songs. In order to reinforce these concepts, students will sing and play instruments such as guitar and keyboard. They will also use digital tools such as MIDI controllers, notation software (Dorico, MuseScore), and digital audio workstations (Garage Band, Logic Pro, FL Studio). This course will function as a prerequisite for other higher-level music classes unless a firm grasp of the concepts and skills is demonstrated to the teacher.

### **MUSIC COMPOSITION SENIOR THESIS\***

#### **Form VI**

##### *Prerequisite*

This yearlong course requires a synthesis of skills developed in all previous music courses. Students will identify an area of musical focus and develop a portfolio of work centered around that focus. Students may choose to work on composition or performance-based projects.

*cont.* Possible areas of focus could include film scoring, video game music composition, choral arranging, songwriting, conducting, etc.

### **MUSIC PRODUCTION & RECORDING**

#### **Form VI, V, IV**

##### *Prerequisite*

This course is designed to help students compose and produce music. A brief study of some modern compositions will inform us, but the bulk of the course will be the art of writing and producing your own songs. Students will learn how to compose using digital and traditional methods, but in the end will have significant authority in deciding what kind of music they are interested in writing. Students will learn the art of writing a good melody, the art of writing effective harmonies, understanding the texture, layering of multiple parts in music, analyzing the components of compositions from various genres, the technological aspect of using digital software to compose music including both music production software such as Garage Band, Logic and music notation software such as Dorico and the art of lyric writing or being a librettist. They will also learn how to use MIDI and digital instruments to enhance their compositions and how to set up microphones to record voices and/or instruments, and how to produce a finished product.

### **MUSIC THEORY & HISTORY**

#### **Form VI, V, IV**

##### *Prerequisite*

This yearlong honors level course will build upon the concepts students have mastered in the Fundamentals of Music Theory course and will include the study of major musical influences in music from around the world. Several aspects of musicianship will be deepened including aural,

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sight-singing, written/compositional, and analytical skills. As the course progresses we will proceed to higher level musical tasks such as dictation (rhythmic, melodic and harmonic), keyboard harmony, and composition.

These skills will be reinforced through a chronological study of music history, using stylistic trends to illustrate the theoretical concepts we are exploring.

Beginning with the Middle Ages, we will observe the evolution of music through time up to the current hits that are popular today.

We will analyze what it is that makes music affect us the way it does and learn how to manipulate sound the same way great musicians have throughout history.

### **ADVANCED ENSEMBLE: ROCK BAND**

#### *Prerequisite*

A performance-based music course that explores the history and evolution of rock music while developing students' instrumental, vocal, and collaborative skills. Students will study major artists, styles, and cultural movements in rock history and apply this knowledge through rehearsal and performance. Emphasis is placed on ensemble musicianship, listening, creativity, and professionalism.

## **THEATER I**

Provides students with opportunities to increase self-awareness, develop critical thinking skills, and explore their talents on and off of the stage. The course begins with an overview of public speaking skills. Students put these skills into practice by performing original monologues and scenes from classic American theatrical works. In addition, students learn to incorporate their skills in literary analysis by translating their critical understanding into choices they make as an actor. Participation as audience members at Upper School productions provides excellent opportunities to connect class work to live theatrical plays performed by their peers. Students also learn the basics of design and technical theatre to enhance their understanding of the collaboration that is necessary to bring theatrical works to life. The introduction of stage combat provides an opportunity for the students to understand how their movements can tell the story as well. The course culminates in the production and performance of a stage combat scene. II. Students of the class form a production company with the goal of presenting a play for The Haverford School community and general viewing audience. Under instructor supervision and guidance, participants select a play, rehearse and perform the show.

## **THEATER II**

### *Prerequisite*

Theater II is an intermediate level course which builds on the skills acquired in Theater I. Using scripts from 20 th and 21 st century plays, students read, discuss and act in works by modern playwrights who are bright examples of the power of drama. Scene study focuses on students taking greater risks in their acting work and performance exercises will also include roles that will stretch the student actor. Individual expression and creativity is also encouraged through dramaturgical projects within the context of each play being studied. Participation in or attendance at all Upper School productions will be mandatory as a way of studying and experiencing the various tools in action. Theatre II will also travel off campus to view a professional production in order to become discriminating consumers of live theatre. The art of directing is an integral unit in Theater II. Each student will direct a scene from one of the plays read in class. They will concentrate on study of the world of the play, character motivation, implementation of blocking, production history, and most importantly, communicating the action of the scene to their peers. Students also begin sword play as they advance to the next level of stage combat. As a final project, students are required to perform a scene of their choice that incorporates the swordplay skills they have acquired.

## **THEATER III: ACTING\***

### *Prerequisite*

Theater III\* Acting is an advanced level Independent Study in theatre generally reserved for Fifth and Sixth Form that incorporates many of the lessons and techniques acquired in Theatre I and II. Students of the class form a production company with the goal of presenting a play for The Haverford School community and general viewing audience. Under instructor supervision and guidance, participants select a play, rehearse and perform the show.

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Each member of the course will also help build the set, procure costumes and props, and will be responsible for the marketing and publicity to promote the show. Professionals from the theatre community are invited to attend performances to give the students valuable feedback. Theatre III gives students an excellent, hands-on experience in establishing and being responsible for their own production company. A focus on playwriting is also optional.

## **THEATER III: DIRECTING\***

### *Prerequisite*

Theater III\* Directing is an advanced level Independent Study in theatre generally reserved for Fifth and Sixth Form that incorporates many of the lessons and techniques acquired in Theatre I and II. Students of the class form a production company with the goal of presenting a play for The Haverford School community and general viewing audience. Under instructor supervision and guidance, participants select a play, rehearse and perform the show. In this section, members will be responsible for directing moments in the performance. Students will deepen their understanding of direction for the theater from Theater II through preparation and practice, all advised by the instructor. Each member of the course will also help build the set, procure costumes and props, and will be responsible for the marketing and publicity to promote the show. Professionals from the theatre community are invited to attend performances to give the students valuable feedback. Theatre III\* Directing gives students an excellent, hands-on experience in establishing and being responsible for their own production company.

# The Visual Arts

## VISUAL ARTS

The Haverford Art Department believes that an understanding of and practice in the visual arts is an essential part of a strong liberal arts curriculum. As well as providing learning experiences that lead to further study and careers in creative professions, the art curriculum emphasizes the ways in which working in the art studio teaches broader essential life skills. Artists often work from observation in order to strengthen their ability to see more powerfully and critically. We understand that artists use this powerful visual language of signs, symbols, colors, and forms to investigate and communicate ideas. Through their studies, students become aware of how this language is at work in the world around them and become skilled in their ability to communicate effectively. Works of art often involve subtle meanings and complex systems of expression that go beyond ordinary speaking and writing. The actual practice of making art engages the imagination, fosters flexible ways of thinking, develops disciplined effort, promotes innovation and builds self-confidence. Creative people of all sorts, artists, writers, designers, scientists and engineers are all well versed in the complex and challenging process of bringing new ideas into being.

Through the Visual Arts curriculum at Haverford, students are able to gain a facility with this creative practice, making it transferable across disciplines. For some students the study of art will lead to careers in the arts. For many others, it will develop a valuable facility with the often frustrating creative process of bringing something new into being, whether they do so in the art world, the business world, scientific careers or wherever they find themselves. Others, too will have permanently enhanced the quality of their lives with a fluency in the visual language and an informed appreciation of the arts.

Each course offered provides students with a broad survey of contemporary and traditional art concepts, techniques and working methods. 2-Dimensional courses emphasize the study of art concepts through the use of drawing, painting and printmaking media. 3-Dimensional courses emphasize traditional sculptural media such as ceramics and woodworking as well as the most contemporary techniques such as 3D printing, laser engraving and product design. 2D Design, Photography and Video & Animation students work with some of the most contemporary digital media available to artists creating photographs, videos, animations and graphic design works. Woodworking Arts addresses these same overarching skills through traditional and contemporary work in this medium. Sequential courses build on the knowledge and skills developed in earlier courses but are flexible enough to allow students to move between 2- dimensional, 3-dimensional or Digital media courses. We strive to instill the courage to face challenges, the skills and practices involved in solving complex problems, a fluency in the primal visual language and an understanding and appreciation of the visual arts and the work of artists throughout time and across cultures.

## **VISUAL ARTS FOUNDATIONS**

This yearlong course introduces students to the fundamental vocabulary of the visual artist across a wide variety of media, and working methods. Students are exposed to those skills, knowledge, and practices fundamental to the visual arts, providing the starting point for all further visual arts courses at Haverford. Students have the opportunity to work with art instructors in three of our art studios. Drawing, Painting, Sculpture, Ceramics, 3D & 2D Design, CAD, 3D printing, and Graphic Design are explored through a variety of hands-on projects. Each project develops students' visual acuity, their fluency in the visual language, and their practice in the creative process. Much emphasis is placed on drawing, painting, sculpting from observation, using the figure, and objects and environments of the students' real world and experiences. By means of structured projects, each student is encouraged to seek imaginative, personal solutions to a wide variety of problems while learning traditional visual art skills and techniques. Creative concepts, strong design, and effective use of media are stressed in an effort to help the student challenge himself and tap his deepest creative potential. Historical and contemporary artists and movements are introduced in relation to each new unit of study. Group critiques, student websites, and written "reflections" give each student the opportunity to learn to articulate his observations about his own work and that of his classmates.

## **2D ART**

### *Prerequisite*

These semester-long courses serve as the second level in the two-dimensional (drawing and painting) art sequence, building on the skills and concepts introduced in the Foundations course. Working in a variety of media with pencil, charcoal, pastel, printmaking techniques, watercolors, and acrylic paints,

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students will explore the fundamentals of line, shape, form, value, color, texture, and composition. Students will begin the course working in black and white and later explore basic color theory. Projects will stress important academic art skills as well as explore prevalent themes in contemporary art, students will strive to develop personal concepts that are well thought out and developed in concept, design, and use of media. Many projects offer significant freedom for students to explore their own ideas and develop their creative thinking skills. Students will use their personal art websites to document and describe their process and product. Students can take both the fall and spring semester course without repeating projects or can combine one semester of this course with another art semester course.

## **2D ART II\***

### *Prerequisite*

This semester-long course is the third level of the two-dimensional (drawing and painting-based) visual arts sequence. Projects continue to build both technical skills and conceptual versatility. New media introduced this year include new printmaking techniques and oil painting. Projects offer the opportunity for more personal approaches to solutions to individualized project challenges. Each project will have a reference to contemporary or historical methods and concepts, giving students an understanding of how their work is part of our cultural tradition. Students will use their personal art websites to document and describe their process and product. As with honors courses in other disciplines, significant time outside class is required in the studio and/or working at home. Students can take both the fall and spring semester course without repeating projects or can combine one semester of this course with another art semester course.

## **3D ART & DESIGN**

### *Prerequisite*

3D Art & Design I is a semester-long, second-level Visual Arts course that builds on skills from Visual Arts Foundations. Students engage in the full design process, research, sketching, development, construction, and reflection, while creating both sculptural and functional objects. Projects may include woodworking, sculpture, product, and architectural design, using materials such as wood, plaster, clay, foam, and wire, as well as tools ranging from sketchbooks to laser cutters and 3D printers. Fall and spring semesters offer distinct projects and may be taken independently or alongside another art course. Open to Fourth through Sixth Form students.

## **3D ART & DESIGN II\***

### *Prerequisite*

3D Art & Design II\* is a third-level sculpture and design course that builds on Foundations and 3D Art & Design I. Students refine technical skills and conceptual development while creating functional and sculptural works using materials such as wood, clay, resin, plaster, foam, and found objects. Through demonstrations, structured challenges, and independent proposals, students explore both manual and digital processes, develop their artistic voice, and collaborate on design-based projects. Significant work outside of class is expected. Fall and spring semesters feature distinct projects and may be taken independently or alongside another arts course. Open to Fifth and Sixth Form students.

## **ART PORTFOLIO: 2D ART\***

### *Prerequisite*

Two-Dimensional Art Portfolio\* is an intensive culminating thesis seminar for the most experienced visual art students. The course is designed to transform experienced art students into emerging young artists by stressing the development of a personal visual arts thesis and a supporting body of work. During class and two hours of extra studio time per week, students will create a related body of work in the form of an investigation. Through individual research and experimentation, each student will discover and refine his most eloquent voice for effective communication in the visual language. While individual artists will work in different media and dissimilar concepts, the class will meet as a group to learn about contemporary artists and critique each other's work. The year finishes with an exhibition of students' thesis works.

## **ART PORTFOLIO: 3D ART\***

### *Prerequisite*

3D Art Portfolio\* is our most advanced sculpture and three-dimensional design course, deepening the skills and processes generated in the 3D Art & Design II\*, Ceramics II\*, and Woodworking II\* course (see above description). Students will be assigned conceptual prompts and projects in addition to individualized areas of research, and self-directed projects. Students will work closely with the instructor through one on one meetings and with their peers through in-progress and final critiques. This class is for the most serious Haverford students who are passionate about developing their voice as an artist and creating a portfolio of their work for future use, i.e. college fine art, architecture, design programs. Students will be pushed to challenge themselves through working within guidelines and how they can continue to make exquisite and thoughtful work that they will be proud of for years to come.

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Students are required and expected to come to 3D Portfolio with an existing complementary website that documents their work at Haverford to date. As with honors courses in other disciplines, significant time outside of class spent in the studio and/or working at home is required.

## **CERAMICS**

### *Prerequisite*

Ceramic Arts is one of three second-level courses in the progression of our 3-Dimensional art curriculum. This semester course is designed to provide a thorough immersion into contemporary and historical practices within the field of Ceramics. Ceramic Arts students will be encouraged to pursue a curiosity about the linkages between process, meaning, and perception within a challenging yet supportive studio environment. Expanding on the ideas presented during the Foundation year experience, Ceramic Arts students will be introduced to and use a huge variety of tools and processes including but not limited to the potter's wheel, figurative sculpture, mold-making, slab-building, and alternative surface treatments. The ultimate aim of this class is to gain the tools and skills to become fearless in the pursuit of an individual artistic voice with skillbuilding, research, and experimentation happening simultaneously. The work in Ceramics, as in all visual art classes, aims to strengthen students' ability to think and see critically, to develop a fluency in the visual language, and to become more adept at the creative process. Students can take both the fall and spring semester courses without repeating projects or can combine one semester with another semester art course.

## **CERAMICS II\***

### *Prerequisite*

Ceramics II\* is an advanced, semester-long course within the 3D art curriculum. Building on the foundation of Ceramics I, this class deepens students' technical skills and conceptual understanding of contemporary and historical ceramic practices. Students refine advanced wheel throwing and handbuilding techniques while creating complex functional and sculptural forms, including lidded vessels, teapots, figurative work, and concept-driven projects. Emphasis is placed on the connection between process, meaning, and perception within a rigorous yet supportive studio environment. Coursework includes custom extruder die construction, plaster mold-making and casting, glaze formulation, and foundational kiln firing practices. Skill-building, research, and experimentation occur simultaneously as students develop greater independence and artistic voice. As in all visual art courses, Ceramics II\* strengthens critical thinking, visual literacy, and creative problem-solving. Significant work outside of class is expected. Students may enroll in both fall and spring semesters without repeating projects or combine one semester with another art course.

## **DIGITAL ART & DESIGN**

### *Prerequisite*

In this semester-long course, students will explore different artistic methods and software. Students will solve complex visual design problems and find their artistic voice. Students will learn about DSLR photography and photo editing, website design, graphic design, laser cutting, CAD & 3D printing, typography, video, and animation. An understanding of composition, color theory, and universal design will be cultivated as students engage in some projects that are centered around personal expression and others with a focus on design for commercial purposes. Students may sign up for fall and/or spring, as the two semesters will have different areas of focus. In the fall semester course, students will primarily explore photography, Adobe Photoshop, and video editing. The spring semester will focus more heavily on Adobe Illustrator, graphic design, typography, and laser cutting. Students in both semesters will hone their creativity, digital literacy skills, and confidence in using emerging technologies. Digital Arts & Technology can be taken a full year or combined with any other semester-long art course.

## **DIGITAL ART & DESIGN II\***

### *Prerequisite*

Students in this semester-long honors digital art course will work across a range of digital media developing personal responses to project challenges related to prevalent themes in contemporary art. Students will deepen their skills with technology-based art mediums such as photography, graphic design, video, animation, CAD, 3D printing, and laser cutting as they explore ideas that are personally compelling and related to the contemporary world of art and design. Students will build on previous coursework as they develop their ability

*cont.*

to use the visual language to communicate, persuade, inform, and connect. This honors course is designed for students who have developed the capacity to work in the art studio independently and are able to devote significant time to their projects outside of class. Students may take the course fall semester, spring semester, or full-year without repeating projects.

## **WOODWORKING**

### *Prerequisite*

This course allows interested students the opportunity to explore the sculptural and functional aspects of design with wood. At the core of our work is developing an understanding for and a facility with the design process. This project-based course will build from simple construction methods with wood and wood tools and gradually expand the scope and skills used to create more complex forms, culminating in a project of the student's own design. Students will have the opportunity and expectation to work imaginatively while accomplishing the goals of each project. The use of hand and power tools as well as the qualities of selected woods will be a component of each unit. Students will learn the basics of linear perspective, orthographic perspective, and scale drawing techniques used by designers, architects and engineers. Students will maintain sketchbooks for planning purposes and a shared personal blog where they will document the progress of their work and learning. Ms. Sides will teach this course with some team teaching help from Mr. Thorburn (Assistant Head). Students can take either the fall or spring semester course and can combine that one semester with another semester-length art course.

## **WOODWORKING II\***

### *Prerequisite*

Woodworking II\* continues the practice begun in Foundations and Woodworking I that develops both the technical skills and conceptual foundations craftsmen use to design and build functional and sculptural works with wood. New tools and techniques are introduced and basic skills are reviewed and strengthened through increasingly complex project challenges. At this level, instructors guide students' development in the creative practice through a sequence of projects based on individual student interests and experience. Students will continue to maintain sketchbooks for planning purposes that will document the progress of their work and learning. Starting with simple to use scroll saws, and working towards milling their own wood from rough sawn lumber, students will learn new tools and techniques as they continue through the levels. Three instructors will team teach this course who all have unique experience with fine woodworking and building. As an honors course, significant time outside of class is expected in the planning, research, and construction phases of these complex projects. Ms. Sides will teach with Mr. Thorburn. Although similar, each semester will vary enough for a student to take both semesters without repeating any material and to deal with increasingly complex ideas and techniques or students can combine one semester of this course with another arts semester course.

# Prerequisites

Prerequisites are conditions that need to be met prior to progressing in a particular course. The prerequisites listed below each course have been thoughtfully determined by the respective Department to ensure that students have the necessary knowledge and skills required to successfully continue in the next sequential course or level. If you have questions about your current recommendation, please contact the respective Department Chair listed on page 48.

## ENGLISH

### English IV\*

- A- in English III
- Recommendation of English III teacher
- Writing Sample

## HISTORY

### European Dictators\*

- A- in United States History
- Recommendation of USH teacher

### History of Science, Sex, and Culture\*

- A- in United States History
- Recommendation of USH teacher

### The Civil War Era\*

- A- in United States History
- Recommendation of USH teacher

### United States History\*

- Recommendation of Modern World History teacher

## MATHEMATICS

### Advanced Computer Science\*

- Completion of Intro. to Computer Science, OR
- Departmental permission

### Advanced Topics in Math\*

- B in Calculus II\*

### Algebra II

- Geometry

### Algebra II\*

- Geometry\* and Departmental permission, OR
- A in Geometry and Departmental permission
- Algebra Readiness tests if deemed appropriate by department

### Calculus

- B+ in PreCalculus, OR
- Departmental permission

### Calculus\*

- B in PreCalculus\* and Departmental permission, OR
- A in PreCalculus and Departmental permission

### Calculus II\*

- Calculus\*, AND
- Departmental permission

### Economics\*

- Calculus (pre or co-requisite)

### Finance: Financial Literacy

- Algebra II

### Introduction to Computer Science

- Geometry (pre or co-requisite)

## Logic

- Algebra II, OR
- PreCalculus concurrently AND
- Departmental permission

## Math Modeling

- Algebra II, OR
- PreCalculus concurrently AND
- Departmental permission

## Statistics

- Algebra II

## Statistics\*

- B+ in Algebra II, OR
- PreCalculus\* AND
- Departmental permission

## PreCalculus

- B in Algebra II, AND
- Departmental permission

## PreCalculus\*

- B+ in Algebra II\*, OR
- A in Algebra II AND
- Departmental permission

## LANGUAGES

### Chinese II

- Successful completion of previous level, AND
- Departmental permission

### Chinese III

- Successful completion of previous level, AND
- Departmental permission

### Chinese III\*

- A in Chinese II, AND
- Departmental permission

### Chinese IV

- Successful completion of previous level, AND
- Departmental permission

### Chinese IV\*

- B in Chinese III\*, AND
- Departmental permission

### Latin II

- Successful completion of previous level, AND
- Departmental permission

### Latin II\*

- A in Latin I, AND
- Departmental permission

### **Latin III**

- Successful completion of previous level, AND
- Departmental permission

### **Latin III\***

- B in Latin II\*, AND
- Departmental permission

### **Latin IV**

- Successful completion of previous level, AND
- Departmental permission

### **Latin IV\***

- B in Latin III\*, AND
- Departmental permission

### **Latin V\***

- B in Latin IV\*, OR
- B+ in Latin IV, AND
- Departmental permission

### **Spanish II**

- Successful completion of previous level, AND
- Departmental permission

### **Spanish II\***

- A in Spanish, AND
- Departmental permission

### **Spanish III**

- Successful completion of previous level, AND
- Departmental permission

### **Spanish III\***

- B in Spanish II\*, AND
- Departmental permission

### **Spanish IV**

- Successful completion of previous level, AND
- Departmental permission

### **Spanish IV\***

- B in Spanish III\*, AND
- Departmental permission

### **Spanish V**

- Successful completion of previous level, AND
- Departmental permission

### **Spanish V\***

- B in Spanish IV\*, AND
- Departmental permission

## **SCIENCE**

### **Biology I**

- Physics I, AND
- Chemistry I, OR
- Departmental permission

### **Biology I\***

- A in Chemistry I\*
- Summer work complete prior to class
- Departmental permission

### **Biology II: Cellular Physiology\***

- B+ in Biology I\*, AND
- Departmental permission

### **Biology II: Molecular Biotechnology\***

- B+ in Biology I\*, AND
- Departmental permission

### **Chemistry I**

- Physics I, OR
- Departmental permission

### **Chemistry I\***

- A in Physics I, AND
- Departmental permission
- Co-requisite: Algebra II or higher

### **Chemistry II: Applied Chemistry\***

- B+ in Chemistry\*, AND
- Departmental permission

### **Chemistry II: Materials Science**

- Chemistry I, AND
- Departmental permission

### **Engineering I**

- Physics I, AND
- Chemistry I or Chemistry I\*, AND
- Departmental permission

### **Environmental Science**

- Biology I or Biology I\*, AND
- Departmental permission

### **Physics I: Problem-Based Approach**

- Geometry\* pre or co-requisite, OR
- Departmental permission

### **Physics II: Applied Laboratory Physics\***

- PreCalculus pre or co-requisite, OR
- Departmental permission

### **Physics II: Electronics\***

- Calculus pre or co-requisite, AND
- Departmental permission

### **Physics II: Theoretical Physics\***

- Calculus pre or co-requisite, AND
- Departmental permission

## **THE FINE ARTS: PERFORMING ARTS Music**

### **Composition and Production**

- Fundamentals of Music, OR
- Departmental permission

### **Music Composition Senior Thesis\***

- Fundamentals of Music, AND
- Music Theory and History, AND
- Music Composition and Production, OR
- Departmental permission

### **Music Theory and History\***

- Fundamentals of Music, OR
- Departmental permission

### **Theater II**

- Theater I, OR
- Departmental permission

**THE FINE ARTS: PERFORMING ARTS**

**Theater III\* Acting or Directing**

- Theater I, AND
- Theater II, AND
- Participation in at least one Centennial Hall production

**THE FINE ARTS: VISUAL ARTS**

**2D, 3D, Ceramics, Digital Arts & Design, Woodworking**

- Visual Art Foundations

**2D II\*, Digital Arts & Design II\*, Woodworking II\*, Advanced 3D Art & Design\***

- Visual Art Foundations, AND
- A- in two semester art electives

**Art Portfolios\***

- Visual Art Foundations, AND
- A- in four semester art electives, AND
- Departmental permission

**Department Chairs**

**English**

Ms. Taylor Smith-Kan,  
tsmithkan@haverford.org

**History**

Ms. Turlish, hturlish@haverford.org

**Languages**

Mr. Poolman, apoolman@haverford.org

**Mathematics**

Mr. Gaudreau, jgaudreau@haverford.org

**Science**

Dr. Goduti, dgoduti@haverford.org

**The Performing Arts**

Mr. Hengst, dhengst@haverford.org

**The Visual Arts**

Ms. Torii, atorii@haverford.org

# Co-Curricular Activities

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**Graduation Requirements:  
3 Credits during Form III & IV  
2 Credits during Form V  
1 Credit during Form VI**

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# Extracurricular & Sports

As a requirement for graduation, boys are expected to take part in athletics and activities. Boys in Third and Fourth Forms must participate in at least three credits of approved interscholastic sports or activities. Boys in the Fifth Form must participate in two credits, and boys in the Sixth Form must participate in one credit of interscholastic sports or the equivalent activity.

## Approved Extracurricular Activity Credits

The following activities have been approved to satisfy one extracurricular activity credit. Third, Fourth and Fifth Form students must participate in at least one interscholastic sport each year to satisfy the extracurricular activity requirement. Third Form students must initiate a credit during the fall season.

<ul style="list-style-type: none"> <li>• Fall Play</li> <li>• Spring Musical</li> <li>• Notables</li> <li>• Glee Club</li> <li>• Jazz Ensemble</li> <li>• Stage Crew*</li> <li>• Orchestra</li> <li>• Rock Band</li> </ul>	<ul style="list-style-type: none"> <li>• Mock Trial</li> <li>• Model United Nations</li> <li>• Speech and Debate</li> <li>• Robotics*</li> <li>• Publication Editor (<i>Pegasus, Index, Haligoluk</i>)</li> </ul>	<ul style="list-style-type: none"> <li>• Fitness (Fall, Winter, Spring)^</li> <li>• Team Manager for Interscholastic Sport</li> <li>• Athletic Livestream Production Crew</li> <li>• Interscholastic Sport (one credit earned per interscholastic sport)</li> </ul>
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\*participation during fall and winter seasons may earn two credits

^is not considered an interscholastic sport; does not satisfy a credit for Fifth and Sixth Form students

## Interscholastic Sports

Third, Fourth and Fifth Form students must participate in at least one interscholastic sport each year to satisfy the extracurricular activity requirement.

Fall	Winter	Spring
Cross Country Crew Football Golf Soccer Water Polo	Basketball Ice Hockey Squash Swimming & Diving Winter Track Wrestling	Baseball Crew Lacrosse Tennis Track & Field Ultimate Frisbee

# Music & Theater

## Glee Club

Students learn the technical aspects of good singing, including breath control, formation of vowel shapes and vocal tone, proper diction in a variety of languages, range extension and agility. Students study repertoire from a variety of genres, from classical to folk to jazz and modern. They perform a capella music as well as music accompanied by piano and orchestra. Through their rehearsal and performances, students learn a valuable skill that can be used as a form of self expression as well as a powerful form of communication. As the music is being rehearsed daily, various compositional techniques and elements of form are pointed out. Glee Club members participate in service learning through outreach performances. This chorus performs at 4 major concerts each year, at Haverford, in New York City, and in our community. The Glee Club joins forces with area girls' schools and with Haverford's boy choir to perform works such as Vivaldi's Gloria, Handel's Messiah, and Haydn, Mozart and Schubert Masses.

## The Haverford School Jazz Ensemble

This ensemble performs a variety of contemporary, jazz-influenced arrangements for winds, brass, and percussion section. Students are auditioned and must demonstrate a satisfactory skill level to participate, as determined by the director. Students learn the skills of performing in an ensemble. They hone their technical skills and play in a variety of jazz styles. More advanced students apply their skills and knowledge to the art of improvisation. Performance venues include school functions as well as evening concerts in the winter and spring. Students must inform their advisor and the Jazz Ensemble Director of their intent for this activity to count towards their Arts graduation requirement.

## Notables

This is the premier vocal ensemble at The Haverford School. An auditioned vocal ensemble, students sing a variety of a cappella music from around the world. Students refine the proper use of their voice, enabling them to sing music of great complexity and vocal range. The Notables perform music in a variety of musical styles, with emphasis placed on historical and stylistic performance practice techniques. Students sing in balanced voice parts, and sing music with up to eight parts. They sing in a number of languages, and memorize a substantial repertoire for performance. Additionally, elements of stage deportment, ambassadorship, and community service comprise a substantial part of ensemble study. The students rehearse extensively, and perform at school and in the larger community. The Notables are committed to providing community service through artistic performance. They perform numerous concerts each year, with the majority performed at hospitals, nursing homes, senior centers and the like.

## Performance and Production Opportunities

Each year, The Haverford School Drama Department produces a minimum of two Upper School plays and/or musicals. By participating in theatrical productions either on the stage or back stage, students will become a vital part of a collaborative team. Students may count their participation in one of the upper school productions as one of their sports requirements. Students may not count participation in both productions as a fulfillment of their sports requirements for the school year.

## Orchestra

Orchestra is an auditioned ensemble. Students must demonstrate satisfactory ability on their principal instrument to participate, as determined by the director. Students learn to phrase artistically, and develop techniques of articulation, expanded dynamic range, and stylistic interpretation through performance of a range of repertoire covering multiple styles and genres. Orchestra members develop ensemble skills such as leading, critical listening, and collaboration. In addition, students refine technical skills on their given instruments. The Orchestra performs during the annual Haverford School performances.

## The Haverford Advanced Chamber Ensembles

These are auditioned ensembles for advanced instrumental players. Students refine their musical skills by studying and performing literature from the standard chamber music repertoire. They focus on playing soloistically within a small ensemble while matching bow strokes, articulations, tone colors and interpretations. The ensembles meet one morning per week and perform throughout the school year.

## Stage Crew

As a member of stage crew, students have the opportunity to participate in the active creation of theatre. Working both on school productions and with professional organizations, students have hands-on experience with carpentry, lighting technology, and with scenic painting. To fulfill one sports requirement through this activity, students must complete one semester of stage crew participation. To fulfill both sports requirements, students need to participate in stage crew for the school year. However, all Haverford students must participate in the athletic program at least once before graduation.

# Clubs

With more than 50 clubs and activities to choose from, our Upper School offers myriad opportunities for students to explore extracurricular activities and to develop leadership skills. All clubs are student designed and student-led, with a faculty adviser who offers guidance and mentoring. Students and faculty are passionate about their interests – and they often extend their club commitments well beyond the boundaries of our schedule and campus.

All of our clubs and activities are active during the full School year. At the beginning of each academic year, students have the opportunity to join or start clubs based on their personal interests, and we enthusiastically encourage them to get involved. The list below is a representative, but not comprehensive, sampling of clubs and activities that have been offered in the Upper School over the past several years.

American Sign Language	Filmmaking	Pan-Asian Alliance
Athletes Helping Athletes	Finance/Eco	PEGASUS
Archery	n Fishing	Pickle BallPoetry
Art	Fly Fishing	Quiz Bowl
Artificial Intelligence	FOCUS	Reading Olympics
Beekeeping	Fox TrotFour Square Ping Pong	Renaissance Men Society
Black Student Union	Gender & Sexuality Alliance	Robotics
Certamen	Geoguesser	Rock Climbing
Chess & Puzzle	Hands-on Haverford	Science
Chinese	Haverford Interact	Ski/SnowboardSneakers & Stuff
Classics	Index	Soft Robotics
Comedy	Jewish Student Union	Speech & Debate
Computer Science	Junior States of America	Star Wars
Consulting & Marketing	Knitting	Sports Film Study
Cooking	Lawn Games	Sustainability Alliance
Cryptocurrency	Math	Sports Film Study
Data Science & Machine Learning	Mindfulness	Voter Registration
Dungeons & Dragons	Mock Trial	Yearbook
Diversity Alliance	Model UN	
Engineering	Modeling	
Entrepreneurs	Muslim Student Association	
Ethics	Newton's Notebook	

# Service Learning

The Upper School Student Service Board at Haverford is very active, with a wide variety of activities and opportunities. These events are student driven and student run and all students are invited to participate. Students who are not on the Service Board are welcome to present ideas for projects at each of our twice-monthly meetings. Students also have the opportunity to lead campaigns to support those in need such as Hunger Relief, the elderly, the homeless, and a variety of other crisis situations as they occur. Some examples of service projects are as follows:

## **City Year Servathon**

A day when volunteers renovate community centers in Philadelphia

## **Empty Bowls**

Year-long hunger awareness education program, culminating with the Empty Bowls supper in Aprils, which raises funds for our local hunger partners and advocates for those challenged by hunger and homelessness.

## **Environmental Work Days**

Throughout the year we partner with local organizations to support and promote environmental projects including: clearing bike and walking trails, cleaning up streambeds, prepping playgrounds for physically disabled, helping plant and harvest at our local CSAs, etc. in Radnor, Haverford and Lower Merion

## **Helping Hunger Cooking Club**

meets several times throughout the year to prepare meals for 200 homeless people at Life Centers of Delaware County and Ronald McDonald House. Together with Agnes Irwin, students cook and later serve these meals.

## **Literacy Program**

supports Bryn Mawr Tutoring and goes to West Philadelphia to tutor young people.

## **Philadelphia Cares Day**

is a day of service involving urban renewal in the Philadelphia schools.

## **Special Olympics**

Invites students to support special needs kids with a weekend of sport activities and “competitions” at this annual event held at Villanova each November.

## **Riverbend Environmental Center's Haunted Trails**

is an annual opportunity for students to help one of our environmental partners stage a fun evening of ghoulish activities for children and nature lovers.

## **Walks & Races:**

AIDS Walk Philly  
American Heart Walk  
Check for Cancer Tournament  
Homerun Baseball Derby for Prostate Cancer  
Research Juvenile Diabetes Walk  
Out of the Darkness Suicide Awareness Walk  
Race for the Cure for Breast Cancer  
The Buddy Walk  
Walk to Cure MS

## QUESTIONS

If you have any questions about the contents of this Course Catalog, please contact:

**Corey Revoir**

Assistant to the Upper School Head

[crevoir@haverford.org](mailto:crevoir@haverford.org)

**Karen Skidmore**

Registrar

[kskidmore@haverford.org](mailto:kskidmore@haverford.org)