



# UPPER SCHOOL

*Course Catalog*

2019-20

## **UPPER SCHOOL ACADEMIC LEADERSHIP**

Art: Megan Culp  
Athletics: Katie Bergstrom Mark  
Classics: Julie Marren  
Computer Science + Digital Media: John King  
Directed Independent Study: Anne Gerbner  
English: Alex Levin  
Health Education: Maryanne Rawlings  
History: Kate Hanssen  
Mathematics: Anne Ross (Interim)  
Modern Languages: Amy Celentano  
Music: Taia Harlos  
Physical Education: Deb Brackett  
Science: Susan Robinson  
Theatre: Lisa Burns & Jake Miller

## **UPPER SCHOOL OFFICE**

Phone: 215-951-2315  
Director of Upper School: Matthew Young  
Administrative Assistant: Karen Barbarese  
[kbarbarese@germantownfriends.org](mailto:kbarbarese@germantownfriends.org)  
Director of Academic Program: Carol Rawlings Miller  
Assistant to the Director of Academic Program: Paula Busser  
Scheduler: Matt Zipin

## **LEARNING EXPERIENCES**

January Term: Matthew Young  
Junior Projects: Andrew Westerhaus  
Global Online Academy: Aaron Preetam

# GERMANTOWN FRIENDS SCHOOL

## UPPER SCHOOL

### *Course Catalog*

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## **COURSE SELECTION PROCESS**

### **NOTE TO STUDENTS AND PARENTS**

The course selection process for the 2019-20 school year begins here. Please review this catalog carefully. Within these pages, you will find your course and program options as well about detailed information about requirements and prerequisites. As you plan, we urge you to seek the counsel of advisors and teachers. We hope you enjoy planning your journey at GFS.

### **CONSIDERING COLLEGE ADMISSIONS AS YOU PLAN**

GFS course requirements allow students the flexibility to pursue their intellectual passions. As they plan, students should keep in mind that most competitive colleges expect to see four years of study in English, History/Social Sciences, Math, Science, and Modern Language.

### **FOUR-YEAR COURSE PLANNING GRID**

The planning grid on page 7 will assist you with drafting various models for your course of study from grades 9 through 12. As you sketch out a multi-year plan, noting your required and elective courses, you will see the ways in which the curriculum might unfold for you. It is wise to repeat this process annually to make sure you are meeting all requirements for graduation.

### **REQUIREMENTS AND A COURSE LOAD NOTE**

Ninth, tenth, and eleventh graders are required to take five major courses; twelfth graders may elect four or five majors. In the rare instance that a student wishes to take six major courses in any grade (an academic overload), they must have the approval of the Upper School Division Director.

### **PREREQUISITES AND DEPARTMENTAL APPROVAL**

Please note that certain courses have prerequisites or, for a variety of reasons, require departmental approval. That information is listed on the departmental pages in this course catalog.

### **COURSE SELECTION TIMELINE**

- Beginning in late January, students seek course selection advice from parents, teachers, Department Heads, and Grade Advisors (and for juniors, from College Counseling as well).
- Online course registration will open on February 8 and close on February 22. When you log in, specific instructions will prompt you regarding the online registration process.
- A receipt of the course requests will be provided to students and parents after the sign-up period ends. A final list of scheduled courses will be provided prior to the end of the school year.
- Add/Drop Period: At the beginning of the school year, students will have two rotations to add or drop a course to their schedule. All adds and drops must be approved by the Grade Dean.

## GRADUATION REQUIREMENTS

To graduate from GFS, students must complete satisfactory work in 19 major courses. Students must meet all departmental major and minor course requirements, participate in January Term, fulfill the Athletics requirement, and complete a Junior Project. See departmental course descriptions for more details. All exceptions to these requirements must be approved by the Academic Standards Committee.

### REQUIRED MAJOR COURSEWORK

**English (4 years)**

**History (3 years)**

**Language (to Level 3)**

Completion to level three of one classical or modern language. Typically the first level of coursework is completed by the end of Middle School (Note: 7th and 8th grade study combined count as Level 1).

**Mathematics (3 years)**

Information about course sequence options appears in the Mathematics Department section.

**Science (3 years)**

Of the courses selected, one science must be physical and one biological.

### OTHER GRADUATION REQUIREMENTS

**Junior Project:** An independent, out-of-school project that takes place during the month of January of junior year.

**January Term:** Students complete January Terms in grades 9, 10, and 12.

### REQUIRED MINOR COURSEWORK

**Music (2 semesters for Class of 2023 and all classes thereafter)**

**Art or Theatre (1 year of study or equivalent of two semesters for Class of 2020 and all classes thereafter)**

**Health (3 semesters)**

- **10th grade:** Health Education 10 (half year)
- **12th grade:** Life Issues (coordinated with Advisory)

**Athletics and Physical Education**

Athletics and PE are distinct but complementary departments. Throughout Upper School, students participate in movement-based activity in PE and/or Athletics, with departmental requirements detailed below.

- **9th grade:** One semester PE 9 Foundations; two seasons Athletics
- **10th grade:** Three seasons: one season of Athletics; choice of Athletics or PE for other two seasons
- **11th grade:** Three seasons, choice of Athletics or PE each season
- **12th grade:** Two seasons, choice of Athletics or PE

#### EXCEPTIONS/ALTERNATIVES TO REQUIREMENTS

- **Academic:** A letter should be emailed to the Director of Upper School and Upper School assistant.
- **Athletics/PE:** Parents should apply using the [online form](#) located on website.

## QUICK REFERENCE TERMS

**Required Course:** A department-specific course required for graduation.

**Elective Course:** A department-specific course not required for graduation.

**Prerequisite:** A course one must take before taking another course.

**Co-requisite:** A course one must take along with another course.

**Major Course:** A “major” typically meets five times in an 8-day cycle and counts as one of the 19 major courses mandated for graduation. There are two kinds of major courses:

- **Required Major:** A major course taken to fulfill a department-specific major course requirement.
- **Elective Major:** A major course that is not required but that can count as one of the 19 majors required.

**Minor Course:** A “minor” meets between two and four times in an 8-day cycle.

**Art, Music, or Theatre Major:** A configuration of minor courses that can, with the permission of the relevant Department Head, form a music, theater, or art major course that counts as one of the major courses for graduation. See department pages for a detailed description.

**Overload:** When a student takes six major courses rather than the standard five (done only with the permission of the Upper School Division Director).

**Advisor:** Advisors serve as primary academic counselors, advocates, and facilitators for students within their advisory group as they seek to learn and grow within the Upper School curriculum.

**Grade Dean:** Grade Deans lead the grade-level team of advisors and teachers, providing additional support, clerking grade-level meetings, overseeing grade-level programming, and supporting student/family concerns as needed in consultation with the Upper School Division Director.

## REGISTRATION NOTES

- **Minor Classes:** Please rank your minor course selections as instructed at the time of course sign-up.
- **A Sixth Major:** Taking five major classes in a given school year fulfills our challenging standard requirement for major coursework. Taking more than five major courses is considered an “overload.” The “overload” course cannot be a required course, and it is possible that an overload course cannot be scheduled. *Any student who wished to take six majors must receive approval from the Upper School Division Director.*
- **Athletics and Physical Education:** Please select choices during course sign-up.
- **Art Classes:** Please select a first and second choice for each Art elective (with the exception of Foundation).
- **Ninth Grade Students taking TWO LANGUAGES:** Students wishing to take two foreign languages to advanced levels:
  - May elect to drop Science in their 9th-grade year and fulfill their Science requirement in subsequent years.
  - May elect to carry six majors as an academic overload with permission from the Upper School Division Director. *See above.*
  - May request exemption from Comparative Cultures with permission from the Upper School Division Director. Students must then take History in 10th, 11th and 12th grades to complete their History Department requirement.
- **Junior-Senior Seminars:** Please indicate a second and third choice (a Junior-Senior Seminar or another major course) when selecting a Junior-Senior Seminar.
- **Advanced Topics in History:** Juniors and Seniors electing these semester-long courses must rank their preferences for both semesters.

## PROGRAM HIGHLIGHTS

**Directed Independent Study:** A “DIS” is an independent major or minor course requested by a student that involves a teacher-student study partnership.

**Global Online Academy:** Small consortium of independent schools that offers online course opportunities open to GFS sophomores, juniors, and seniors. Sophomores may register with approval of Upper School Division Director.

**January Term:** A month-long opportunity to explore new courses of study. Classes are innovative, hands-on course offerings composed of mixed-grade groups of 9th, 10th and 12th graders. Courses are taken on a Credit/No Credit basis.

**Junior Project:** The required independent project all juniors undertake off-campus in the month of January of their junior year.

**Junior-Senior Seminars:** Major elective courses offered each school year in innovative subjects that are often interdisciplinary in nature. These courses change year to year.

## DEPARTMENTAL APPROVAL REQUIRED

The following options are subject to departmental approval from the appropriate Department Head. After signing up for the course, if the student does not receive approval, he or she will be notified by the Department Head or Grade Advisor, and will be given the opportunity to amend his or her course selections.

### ART

- Students creating an Art Major
- Students electing Senior Studio (portfolio also required)

### CLASSICS

- Students dropping a classical language

### MATHEMATICS

Please see Mathematics course descriptions for departmental approval requirements.

- Students moving into or out of an accelerated or advanced course
- Students dropping math in their senior year
- Students new to GFS must take a math assessment; course placement must have departmental approval

### MODERN LANGUAGES

Students dropping a modern language

### MUSIC

- Students creating a Music Major
- Please note: Admission to Choir and Cantare is audition-based.

### ATHLETICS + PHYSICAL EDUCATION

Students proposing alternative to Athletics/PE requirements should apply using the [online form](#) located on PE department page of the website.

### SCIENCE

Students electing Biology: Advanced, Physics: Advanced, or Chemistry: Advanced

### THEATRE

Students creating a Theatre Major

### DIRECTED INDEPENDENT STUDY (DIS)

Students registering for a DIS Major must write a formal proposal by early May that has the approval of the Director of Independent Studies and the Academic Standards Committee.

### GLOBAL ONLINE ACADEMY (GOA)

Students electing to take a GOA course require approval from the GFS site director. Sophomores will need to register with approval of Upper School Division Director.

## EXCEPTIONS/ALTERNATIVES TO REQUIREMENTS

Any request for alternatives to our standard program not resolved with departments can be directed to the Upper School Division Director.

# FOUR-YEAR COURSE PLANNING GRID

In thinking about course choices, you may want to sketch out a plan of study incorporating graduation requirements and electives. Five majors are required of all students in grades 9-11 and either four or five may be taken in 12th grade.

	9TH GRADE	10TH GRADE	11TH GRADE	12TH GRADE
MAJORS	5 required	5 required	5 required	4 or 5 required
<b>ENGLISH</b>	Exploration of Identity	Poetry of Language	Literary Analysis, Poetics, & Composition - Part I: Advanced	Literary Analysis, Poetics, & Composition - Part 2: Advanced
<b>HISTORY</b>	Comparative Cultures	Ancient & Medieval Civilizations or Latin History	US History: Advanced can be taken in 11th or 12th grade.	
<b>LANGUAGE</b>				
<b>MATHEMATICS</b>				
<b>SCIENCE</b>				
<b>JR/SR SEMINAR</b>				
<b>MUSIC</b>	Two semesters of Music elected in grades 9-12			
<b>ART &amp; THEATRE</b>	Two semesters of Art or Theatre			
MINORS				
<b>ADVISORY</b>	Advisory 9	Advisory 10	Navigation	Life Issues (Coordinated with Health)
<b>ART</b>				
<b>COMPUTER SCIENCE + DIGITAL MEDIA</b>				
<b>THEATRE</b>				
<b>HEALTH</b>		Health Education (half-year)		Life Issues (Coordinated with Advisory)
<b>MUSIC</b>				
<b>GOA, DIS &amp; OTHER</b>	Common Spark and Style Fundamentals			
ATHLETICS & PHYSICAL EDUCATION				
	<b>FULL YEAR</b> <ul style="list-style-type: none"> <li>One semester PE 9 Foundations</li> <li>Two seasons of Athletics</li> </ul>	<b>FULL YEAR</b> <ul style="list-style-type: none"> <li>One season Athletics</li> <li>Choice of Athletics or PE for other two seasons</li> </ul>	<b>FULL YEAR</b> <ul style="list-style-type: none"> <li>Three seasons, Choice of Athletics or PE</li> </ul>	<b>TWO SEASONS</b> <ul style="list-style-type: none"> <li>Choice of Athletics or PE</li> </ul>
	(F) _____ (W) _____ (S) _____	(F) _____ (W) _____ (S) _____	(F) _____ (W) _____ (S) _____	(F) _____ (W) _____ (S) _____

# DEPARTMENTAL COURSE OFFERINGS GRID

COURSE TITLE	GRADE	TIMES PER CYCLE	INFORMATION
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\*Requires departmental approval

"+"= may use hook period

See course descriptions for full information.

## ART

Please note: Foundation is a prerequisite for all other studio classes, including Photography and Mixed-Media Animation..

Foundation	9, 10, 11, 12	3	minor elective
Color & Design	10, 11, 12	4	minor elective
Drawing & Painting	10, 11, 12	4	minor elective
•NEW• Creative Furniture Making	10, 11, 12	3	minor elective
3-Dimensional Art	10, 11, 12	4	minor elective
Digital Collage	10, 11, 12	4	minor elective next offered 2020-21
Photography I	11, 12	3+	minor elective
Photo II: The Journey Continues	12	3+	minor elective prerequisite: Photo I
Senior Studio: Advanced	12	5	major elective
Mixed-Media Animation	10, 11, 12	3	minor elective
•NEW• Art History: The Individual & Society	10, 11, 12	3	minor elective
•NEW• Art History: Nature, Spirit, & Religion	10, 11, 12	3	minor elective next offered 2020-21
Art Major*	10, 11, 12		Art History + studio course or two studio courses

## CLASSICAL LANGUAGES

Ancient Greek I	9, 10, 11, 12	5	major elective
Ancient Greek II	9, 10, 11, 12	5	major elective prerequisite: Greek I
Ancient Greek III	10, 11, 12	5	major elective prerequisite: Greek II
Ancient Greek IV: Advanced	11, 12	5	major elective prerequisite: Greek III
Ancient Greek V: Advanced	12	5	major elective prerequisite: Greek IV
Latin I	9, 10, 11	5	major elective
Latin II	9, 10, 11, 12	5	major elective prerequisite: Latin I or Latin IB
Latin III (History)	10	5	major elective prerequisite: Latin II; co-requisite: Latin III History
Latin III (Literature)	9, 10, 11, 12	5	major elective prerequisite: Latin II
Latin IV: Advanced	10, 11, 12	5	major elective prerequisite: Latin III (History or Literature)
Latin V: Advanced	11, 12	5	major elective prerequisite: Latin IV

## COMPUTER SCIENCE + DIGITAL MEDIA

Robotics	9, 10, 11, 12	3	minor elective (one semester course)
Computer Science 1: Introductory Programming	9, 10, 11, 12	3	minor elective
Introductory Programming: Girls Who Code	9, 10, 11, 12	3	minor elective
Computer Science 2: Object-Oriented Programming	10, 11, 12	3	minor elective prerequisite: Computer Science 1, or by permission of instructor
Computer Science 3: Algorithms and Computer Organization	11, 12	3	minor elective prerequisite: Computer Science 2, or by permission of instructor

COURSE TITLE	GRADE	TIMES PER CYCLE	INFORMATION
*Requires departmental approval		"+"= may use hook period	See course descriptions for full information.
Mobile App Development	9, 10, 11, 12	3	minor elective
Electronics Design Workshop	10, 11, 12	3	minor elective prerequisite: Computer Science 1 or Robotics, or by permission of the instructor
•NEW• Computer Science Programming Capstone*	11, 12	3	minor elective prerequisite: Computer Science 3 or department approval
•NEW• Digital Design I	9, 10, 11, 12	3	minor elective
Web Design & Development I	9, 10, 11, 12	3	minor elective
Web Design & Development II	10, 11, 12	3	minor elective prerequisite: Web Design & Development I, or by permission of instructor
Mixed-Media Animation	10, 11, 12	3	minor elective prerequisite: Foundation (Art)
<b>ENGLISH</b>			
Exploration of Identity	9	5	required major
•NEW• Style Fundamentals	9	1	required minor (one semester course)
Poetry of Language	10	5	required major
Literary Analysis, Poetics, and Composition I: Advanced	11	5	required major
Literary Analysis, Poetics, and Composition II: Advanced	12	5	required major
•NEW• Poetry Workshop	10, 11, 12	3	minor elective
•NEW• Narrative Journalism	10, 11, 12	3	minor elective
<b>HEALTH EDUCATION</b>			
Health Education 10	10	3	required minor (one semester course)
Life Issues	12	1	required minor (coordinated with Advisory)
<b>HISTORY</b>			
Comparative Cultures	9	5	required major
Ancient & Medieval Civilizations	10	5	required major option for 10th graders
Latin History	10	5	required major option for 10th graders co-requisite: Latin III (History)
United States History: Advanced	11, 12	5	required major
ADVANCED TOPICS IN HISTORY	11, 12	5	major elective (one semester courses)
Fall Offerings: <ul style="list-style-type: none"> <li>• NEW African American Studies</li> <li>• NEW The Making of the Modern World</li> <li>• U.S. Government and Civics</li> <li>• War and Peace: The Modern Middle East</li> </ul> Spring Offerings: <ul style="list-style-type: none"> <li>• NEW Europe: World War II and Beyond</li> <li>• NEW Genocide and Human Rights</li> <li>• NEW History of Science: From Darwin to DNA</li> <li>• Modern U.S. Political Ideologies and Issues</li> </ul>			

COURSE TITLE	GRADE	TIMES PER CYCLE	INFORMATION
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\*Requires departmental approval

"+"= may use hook period

See course descriptions for full information.

### JUNIOR-SENIOR SEMINARS

•NEW• Design Thinking for Social Impact	11, 12	5	major elective
•NEW• Digital Humanities	11, 12	5	major elective
•NEW• Playwriting Workshop	11, 12	5	major elective
World Religions	11, 12	5	major elective
•NEW• You Can Hear the Whistle Blow: The Literature of Slavery, The Abolition Movement, and the Underground Railroad	11, 12	5	major elective

### ADDITIONAL OFFERINGS

Applied Economics	11, 12	5	major elective
•NEW• Common Spark	9	2	required minor (one semester course)
Exploring Differences and Common Ground: Social Justice Dialogue	9, 10, 11, 12	2	minor elective
Peer Writing Advisor Training Part 2: Theory into Practice	11, 12	2	minor elective prerequisite: Peer Writing Advisor Training (Essentially English course)

### MATHEMATICS

Please see Mathematics section for course sequencing options, prerequisites, and departmental approval requirements.

### MODERN LANGUAGES

French I	9, 10, 11	5	major elective
French II	9, 10, 11, 12	5	major elective prerequisite: French I
French III	10, 11, 12	5	major elective prerequisite: French II
French IV: Advanced	11, 12	5	major elective prerequisite: French III
French V: Advanced	11, 12	5	major elective prerequisite: French IV
Mandarin I	9, 10, 11, 12	5	major elective
Mandarin II and III*	9, 10, 11, 12	5	major elective prerequisite: Mandarin I or II
Mandarin IV and V*: Advanced	9, 10, 11, 12	5	major elective prerequisite: Mandarin III or IV
Spanish II	9, 10, 11, 12	5	major elective prerequisite: Spanish I
Spanish III	10, 11, 12	5	major elective prerequisite: Spanish II
Spanish IV: Advanced	10, 11, 12	5	major elective prerequisite: Spanish III
Spanish V: Advanced	11, 12	5	major elective prerequisite: Spanish IV

### MUSIC

#### FALL

•NEW• Found Sound	9, 10, 11, 12	2	minor elective (one semester)
•NEW• Music and Cultures	9, 10, 11, 12	2	minor elective (one semester)
•NEW• Musical Instrument Building	9, 10, 11, 12	3	minor elective (one semester)
•NEW• Critical Listening in Music	9, 10, 11, 12	2	minor elective (one semester)
•NEW• History and Impact of Hip-Hop	9, 10, 11, 12	2	minor elective (one semester)

COURSE TITLE	GRADE	TIMES PER CYCLE	INFORMATION
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\*Requires departmental approval

"+"= may use hook period

See course descriptions for full information.

**SPRING**

•NEW• Conducting	9, 10, 11, 12	2	minor elective (one semester)
•NEW• 9th Grade Musical Theatre	9	2 + evening rehearsals	minor elective (one semester)
•NEW• Songwriting	9, 10, 11, 12	2	minor elective (one semester)
•NEW• Critical Listening in Music	9, 10, 11, 12	2	minor elective (one semester)
Keyboarding	9, 10, 11, 12	2	minor elective

**YEARLONG**

Jazz Ensembles	9, 10, 11, 12	2	minor elective co-requisite: private lessons
Chamber Ensembles	9, 10, 11, 12	2	minor elective co-requisite: private lessons
Orchestra	9, 10, 11, 12	3+	minor elective co-requisite: private lessons
World Percussion Ensemble	9, 10, 11, 12	2	minor elective
Chorus	9, 10, 11, 12	2	minor elective
Choir*	10, 11, 12	3 + Sunday rehearsals	minor elective co-requisite: Chorus
Instrumental Improvisation	9, 10, 11, 12	2	minor elective
•NEW• Cantare	9, 10, 11, 12	2	minor elective
Sight Singing & Ear Training	9, 10, 11, 12	2	minor elective
Music Theory I	9, 10, 11, 12	4	minor elective
Music Theory II: Advanced	10, 11, 12	4	minor elective prerequisite: Music Theory I (or dept. approval)
Music Composition I: Advanced	11, 12	4	minor elective prerequisite: Music Theory II (or dept. approval)
Music Composition II: Advanced	11, 12	5	major elective prerequisite: consent of the instructor
Masterworks in Music	9, 10, 11, 12	2	minor elective
Digital Music Recording & Production	9, 10, 11, 12	2	minor elective
Music Major*	9, 10, 11, 12		Music Major: 1 or more academic + 1 or more performance electives equaling 5 class periods

**PHYSICAL EDUCATION**

Please see PE section for more information about requirements and electives.

PE 9 Foundations	9	3	required minor (one semester)
PE Electives or GFS Fitness Club	10, 11, 12	2+	required minor (Fitness Club is after school 2x/week)

**SCIENCE**

Physics (physical)	9, 10	5+	major elective
Chemistry (physical)	10, 11	5+	major elective
Biology (biological)	11, 12	5+	required major
Environmental Science	11, 12	5+	major elective prerequisite: Chemistry

COURSE TITLE	GRADE	TIMES PER CYCLE	INFORMATION
*Requires departmental approval		"+"= may use hook period	See course descriptions for full information.
Advanced Chemistry (physical)*	11, 12	5+	major elective prerequisite: Chemistry
Advanced Biology (biological)*	12	5+	major elective prerequisite: satisfactory completion of Chemistry and Biology
Advanced Physics (physical)*	12	5+	major elective prerequisite: completion or concurrent enrollment in Calculus or Integral Calculus
•NEW• Human Anatomy and Physiology	10, 11, 12	3+	minor elective
<b>THEATRE</b>			
<b>ACTING &amp; PERFORMANCE-BASED COURSES</b>			
Acting Fundamentals	9	2+	minor elective
Acting Methods	10	3	minor elective
•NEW• 9th Grade Musical	9	2 + evening rehearsals	minor elective (one semester)
•NEW• Improv Theatre	10, 11, 12	1	minor elective
•NEW• Musical Theatre	10, 11, 12	3	minor elective (one semester)
Acting & Directing Techniques	11, 12	3	minor elective
<b>DANCE &amp; MOVEMENT COURSES</b>			
Movement for Theatre	10, 11, 12	2	minor elective (one semester) can be taken for Theatre or PE credit
•NEW• Modern Dance	10, 11, 12	2	minor elective (one semester) can be taken for Theatre or PE credit
<b>TECHNICAL THEATRE COURSES</b>			
Technical Theatre	9, 10, 11, 12	2	minor elective
•NEW• 9th Grade Musical: Stage Crew, Stage Management, and Costuming	9	2 + evening work calls	minor elective (one semester)
•NEW• Stage Management & Set Design	10, 11, 12	3	minor elective (one semester)
<b>ACADEMIC COURSES</b>			
Reader's Theatre	11, 12	2	minor elective
Shakespeare Studio	11, 12	5	major elective
Theatre Major*	11, 12		Acting & Directing Techniques <i>and</i> Reader's Theatre
<b>FILMMAKING COURSES</b>			
Introduction to Filmmaking	10, 11, 12	3	minor elective
•NEW• Film Editing & Post-Production	11, 12	3	minor elective (one semester) prerequisite: Intro to Filmmaking
•NEW• Light, Sound, and Production Design	11, 12	3	minor elective (one semester) prerequisite: Intro to Filmmaking
•NEW• Filmmaking: The Picture is the Thing: Advanced	11, 12	3	minor elective prerequisite: Intro to Filmmaking <i>and</i> Film Editing & Post-Production <i>or</i> Light, Sound, & Production

COURSE TITLE	GRADE	TIMES PER CYCLE	INFORMATION
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\*Requires departmental approval

"+"= may use hook period

See course descriptions for full information.

### DIRECTED INDEPENDENT STUDY

Please see Directed Independent Study description for details.

DIS Major*	11, 12		major elective
DIS Minor*	9, 10, 11, 12		minor elective
DIS Minor in World Language (American Sign Language, Arabic, German, Italian, Japanese, Russian)*	9, 10, 11, 12	2	minor elective

### GLOBAL ONLINE ACADEMY (GOA)

Please see GOA section for course descriptions and registration details.

GOA Courses*	10, 11, 12		major elective
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## ART

The Upper School Art Program provides depth and breadth—students are introduced to appropriate skills and concepts that gradually build in complexity. Through the exploration of various materials and media, students investigate formal and conceptual issues with increasing independence. We are concerned not only with the making of art but also with the development of critical thinking, visual literacy and art history awareness. Using a problem-solving format, criteria are first presented and examined, and then students develop individual solutions to answer assigned problems creatively. Each assignment culminates in a group critique in which students use appropriate visual arts language to inform their critical thinking. Students learn to recognize quality and to appreciate the uniqueness and diversity of effective responses.

- The course Foundation is a prerequisite for all other art electives.
- Students must select a first and second choice for art electives with the exception of Foundation.
- Each course may be taken only once.
- Art courses may be chosen individually as minors, or together in certain configurations to form an Art Major.
- **Art Major:** An Art Major is comprised of two art minors taken simultaneously. These two courses make up an Art Major. At course sign-up, students in grades 10-12 wishing to create an Art Major should select their two minors and also select ART790 Art Major.

### ART310 Foundation

minor elective | grades: 9, 10, 11, 12

This course is designed to introduce and investigate visual concepts. These concepts of 2D and 3D composition include line, plane, negative/positive space, perspective, color, value and figure/ground. Each unit of study is tailored to build technical skill and theoretical understanding, as well as to develop critical thinking and problem-solving skills regardless of prior experience. Through critiques, students learn to use a visual vocabulary to analyze formal issues. Successful completion of this course is a prerequisite for Photography I & II, Drawing and Painting, Color & Design, 3-Dimensional Art, Digital Collage, Mixed Media Animation, Senior Studio, and yearbook layout.

### ART830 Color & Design

minor elective | grades: 10, 11, 12  
prerequisite: Foundation

In this course, students concentrate on how color and design can be used to describe and communicate ideas through visual means. We investigate color as it can be used emotionally and psychologically for practical and poetic ends. Students will study layout and design,

using elements of realistic and abstract form. Assignments emphasize creative problem solving and varying conceptual exercises, the solutions to which may be used for school publications. Multiple techniques and media will be used including collage, drawing, painting and digital media. Skill development will underlay all of our study. Because space is limited, students electing this course should specify a 2nd/3rd art course choice when they sign up. **Enrollment limited to 12 students per section.**

### ART840 Drawing & Painting

minor elective | grades: 10, 11, 12  
prerequisite: Foundation

The year will begin with drawing. We will define drawing in many ways, from the observed and structural to the expressive and conceptual. A variety of media will be introduced throughout the course. Painting will follow as a natural outgrowth, with a focus on color, value and materials. There will be continual emphasis on the traditional subjects of figure, landscape, and still life, as well as on the first steps the young artist takes in finding their own subjects and style. **Enrollment limited to 12 students per section.**

**-NEW-**

## **ART880 Creative Furniture Making**

minor elective | grades: 10, 11, 12

prerequisite: Foundation

This class will focus on creative furniture making. Students will learn traditional woodworking techniques while practicing discipline, patience, and problem-solving skills. With a strong emphasis on safety, students will develop a practical understanding of hand tools and learn to operate a table saw, band saw, miter saw, routing table, and power tools. Students will first learn about joinery focusing on the mortise and tenon followed by designing and creating a scale drawing. Students will undertake a major furniture project determined by their interests and skills. **Class is limited to ten students.**

## **ART810 3-Dimensional Art**

minor elective | grades: 10, 11, 12

prerequisite: Foundation

This studio course is an introduction to three-dimensional design. Emphasis is placed on creatively solving problems and communicating ideas through the use of numerous materials in a “learn-by-doing” process. The willingness to take technical and conceptual risks is essential to the course. Each project will begin with drawing to guide students thinking of formal considerations. Historical and contemporary art and design will inform thinking and strategies. As the year progresses, projects will become more complex and students will be afforded opportunities for experimentation and personal expression. Because space is limited, students electing this course should specify a 2nd /3rd art course choice when they sign up. **Enrollment limited to 12 students per section.**

## **ART860 Digital Collage (Next Offered in 2020-21)**

minor elective | grades: 10, 11, 12

prerequisite: Foundation

This digital lab course introduces the computer as an artistic tool for drawing, painting and collage. We will take advantage of aspects that are unique to digital drawing, such as layering, scaling, the incorporation of photography, and

working with states of revision. This course is about expanding the narrative possibilities of image-making through contemporary processes of edition and image construction using Photoshop and Illustrator. Students will be exposed to advanced methods of editing still and moving images, video and animation. Because space is limited, students electing this course should specify a 2nd/3rd art course choice when they sign up. **Enrollment limited to 12 students per section.**

## **ART850 Photography I**

minor elective | grades: 11, 12

prerequisite: Foundation

This is an introductory course that explores the technical and aesthetic possibilities of the photograph. Students will first master the skills of black-and-white darkroom photography; an introduction to digital images and alternative photographic processes will follow. Throughout the course, attention will be paid to the content and composition of photographs, as students solve problems in portraiture, documentary, studio photography and social commentary. There is a lab fee of \$100 for this course. A limited number of school cameras are available for students on an as-needed basis. Because space is limited, students electing this course should specify a 2nd/3rd art course choice when they sign up. **Enrollment limited to 12 students per section.**

## **ART920 Photo II: The Journey Continues**

minor elective | Grade 12

prerequisite: Photography I

The Journey Continues provides students the opportunity to grow as artists. Building on their foundational knowledge in the darkroom and the digital lab, students will explore new creative approaches to the medium and learn advanced technical skills as they experiment with light and ways of seeing. As students build their photographic portfolios, they will look critically not only at their own work but also at the work of renowned photographers. The Journey Continues classroom provides students their own computers and workspace, offering them the time, space,

and occasion to organize their portfolios for the college admissions process. At the end of the year, each student will create a final presentation in a form of their own choosing.

### **ART610 Senior Studio: Advanced**

major elective | grade: 12

prerequisite: Foundation plus one of the following: Drawing & Painting; Color & Design; Digital Collage; Photography or 3-Dimensional Art. Drawing & Painting, and Art History are strongly recommended as preparation; departmental approval required

This advanced studio course stresses the development of technical and aesthetic skills, and the development of original, personal vision. Both classical and contemporary approaches to visual arts will receive attention with particular emphasis on personal expression through the synthesis of formal considerations. Other areas of study include color theory, abstraction, observational, conceptual, and narrative work. Guidance and support is provided for the preparation of a strong portfolio for college admissions. Regular homework and some reading and critical writing are required. **Enrollment limited to 12 students per section, and will be determined by a portfolio evaluation plus one directed assignment.**

### **ART870 Mixed-Media Animation**

minor elective | grades: 10, 11, 12

prerequisite: Foundation

This course introduces students to a variety of traditional and contemporary techniques in animation. Looking at examples of animations in art and film, as well as nonfiction topics such as science and history, students will learn hand-drawn, stop-motion and digital methods for making their own animations. Story building will be key in developing ideas for production. Students will also learn to edit the animations and incorporate sound effects and music. Throughout the course, students will produce a series of short animated sequences using a variety of techniques, themes, and media as they explore how these choices impact their stories. These works will build to one or more major projects. An historical overview and international

perspective are provided through film screenings and group discussion, and students will review and discuss current trends in animation.

**Enrollment limited to 12 students per section.**

**-UPDATED FOR 2019-20-**

### **ART731 Art History: The Individual and Society**

minor elective | grades: 10, 11, 12

prerequisite: Foundation

In Art History we will use the structure of themed inquiry to look at western and non-western art across history. Artworks will be studied through the lens of “The Individual and Society,” allowing students to explore the role of art in the making, changing, and maintaining the elements of society and how this impacts the human experience across various cultures and periods of history. The themes that will be examined under this lens will be: Patronage and Commerce in Art, Sacred Spaces, Art as Resistance, Gender in Art, and the Role of the Audience in Art.

The major goal of this course is to give students a grounding in looking at art and making sense of what they see. As they learn the skills of observation, analysis, and interpretation, students examine the stylistic, iconographic and technical development of architecture, painting, sculpture, and craft art.

**Themes will be on a two-year rotation, allowing students to take the course twice. Art History: Nature, Spirit, and Religion will be offered in 2020-21.**

## ATHLETICS

The athletics program at GFS stresses participation and encourages all student athletes to develop their capabilities to the fullest extent possible. We value excellence in each sport and aim to field successful teams that are competitive within the Friends Schools League as well as with other comparable schools. We want our student athletes to be committed to themselves, their team, the GFS school community, and the Friends Schools League. In order to do this, they need to learn what it means to cooperate with others, to set individual and team goals, to manage their time with other areas of their lives, to deal positively with setbacks, and to learn the physical and technical skills demanded by their sport. It is our hope that as students progress through our athletic program, they gain a stronger sense of themselves and their role in the GFS community.

**Graduation Requirement Note:** Students must participate in two seasons of Athletics in 9th grade and one season of Athletics in 10th grade.

SEASON	GIRLS	BOYS
<b>FALL</b>		
	<b>ATH802</b> Cross Country	<b>ATH808</b> Cross Country
	<b>ATH803</b> Field Hockey	<b>ATH809</b> Soccer
	<b>ATH804</b> Soccer	<b>ATH806</b> Club Crew*
	<b>ATH805</b> Tennis	
	<b>ATH806</b> Club Crew*	
<b>WINTER</b>		
	<b>ATH812</b> Basketball	<b>ATH816</b> Basketball
	<b>ATH813</b> Squash	<b>ATH817</b> Squash
	<b>ATH814</b> Indoor Track & Field	<b>ATH818</b> Indoor Track & Field
	<b>ATH811</b> Wrestling	<b>ATH819</b> Wrestling
<b>SPRING</b>		
	<b>ATH822</b> Lacrosse	<b>ATH826</b> Baseball
	<b>ATH823</b> Softball	<b>ATH827</b> Tennis
	<b>ATH824</b> Track & Field	<b>ATH828</b> Track & Field
	<b>ATH807</b> Club Crew*	<b>ATH807</b> Club Crew*
Several programs offer sport-specific, off-season training. Please contact Head Coach or Athletics Director with questions.		

*\*Note on Club Crew: Rowing is a co-ed sport with additional fees associated with participation. GFS is committed to making all athletic offerings available to the student body. Information about financial aid is available through the Business Office.*

## ATHLETES AND GENDER

GFS is committed to supporting gender nonconforming and transgender athletes. For more on inclusion at GFS, please visit the *About Us* section of the GFS website. Please contact our Athletics Director with any questions or concerns.

## EXCEPTIONS & ALTERNATIVES TO ATHLETIC REQUIREMENTS

We value the sense of community, camaraderie, physical well-being and skill development that come through participating in athletics at GFS. It is our expectation that all students will actively participate in our program and fulfill the athletic requirements.

Students who have undertaken a clear course of study and demonstrated a solid commitment to an out-of-school sport may request an exemption for one athletic season at GFS. Since this out-of-school sport would replace an existing part of the school curriculum, both family and school must give careful thought to such a decision. This does not apply to an activity that is new to a student.

Parents make requests by submitting the [Exceptions & Alternatives Request Form](#) during the course sign-up period. This form can be found on the Physical Education page within the Upper School Curriculum section of website. In addition, students must confirm this request during online course sign-up. Students will be asked for timely updates about their alternative athletic commitment and the school will be in touch with the designated coach outside of school.

Decisions will be made by the Requirements Committee (Upper School Division Director, Director of Athletics, Director of PE, and, when warranted, the Grade Dean). Every attempt will be made to communicate about these decisions in a timely manner.

## CLASSICAL LANGUAGE

The Classics department offers Latin and Greek in grades 7-12. Our Classics teachers focus on training students to develop proficiency in the languages and become close, analytical readers of the literature. Our program covers quite a breadth of material. Students read a wide range of poetry and prose texts, and learn about ancient philosophy, rhetoric, culture and history. Students come out of our program able to interpret, analyze and connect the texts that have shaped Western literature for the last two millennia. Events like Classics Day involve our students in lively, collaborative learning, and our Classics Trip to Italy every three years allows our students a chance to see their texts in context. Many students go on to study Classics in college and beyond.

**Graduation Requirement Note:** Students must complete a Level III modern or classical language to graduate. Anyone considering dropping a language must get approval from the Head of Classics.

### **CLA710 Ancient Greek I**

major elective | grades: 9, 10, 11, 12

This course provides an introduction to ancient Greek, beginning with learning the alphabet, a parent of our own alphabet. From this, students will study the basic grammar of ancient Greek, with a focus on developing a strong working vocabulary, and a facility with declensions and conjugations, and becoming familiar with the syntax. While reading and writing in ancient Greek, we will also examine the cultural context of the language in myth, history, and art. Along with the other Greek classes, students put on a performance for Classics Day.

### **CLA720 Ancient Greek II**

major elective | grades: 9, 10, 11, 12  
prerequisite: Ancient Greek I

In this course, students complete their study of basic ancient Greek grammar, learning all common verb forms and constructions. In conjunction with investigating select cultural topics, students practice translating, writing, and reading for comprehension. This prepares students to read the literature of real Greek authors the following year, whether heroic epic, myth, history, or drama. Along with the other Greek classes, students put on a performance for Classics Day.

### **CLA730 Ancient Greek III**

major elective | grades: 10, 11, 12  
prerequisite: Ancient Greek II

Starting in the third year, students begin to translate and explore actual ancient literature.

Topics and genres will vary year to year, and may include Greek history (e.g., Herodotus or Xenophon), legal oratory (Lysias), tragedy (Euripides), or epic (Homer). We will explore the social and historical context of the works as well as their literary aspects and later influences. Students will undertake related projects individually or in small groups.

### **CLA740 Ancient Greek IV: Advanced**

major elective | grades: 11, 12  
prerequisite: Ancient Greek III

Topics and genres will vary year by year, and may include Greek history (e.g., Herodotus or Xenophon), legal oratory (Lysias), tragedy (Euripides), or epic (Homer). We will explore the social and historical context of the works as well as their literary aspects and later influences. Students will undertake related projects individually or in small groups.

### **CLA750 Ancient Greek V: Advanced**

major elective | grade: 12  
prerequisite: Ancient Greek IV

Topics and genres will vary year by year, and may include Greek history (e.g., Herodotus or Xenophon), legal oratory (Lysias), tragedy (Euripides), or epic (Homer). We will explore the social and historical context of the works as well as their literary aspects and later influences. Students will undertake related projects individually or in small groups.

## **CLA310 Latin I**

major elective | grades: 9, 10, 11

An introduction to the Latin language and its basic forms, vocabulary and grammar, Latin I is taught through English. The course motivates students to delve into the Latin roots of English words, seeing that understanding Latin vocabulary can bring seemingly difficult English words to life. We also explore the similarities among Latin, French, and Spanish. Since students taking this course will join those students in the two-year Middle School course, there is strong emphasis on mastering grammar and forms. The reading material uses adapted, authentic works of Latin literature to increase student interest and enliven discussion of Greek and Roman culture.

## **CLA320 Latin II**

major elective | grades: 9, 10, 11, 12  
prerequisite: Latin I

This second-year course completes the study of Latin grammar and provides increasing emphasis on reading skills. Students develop the skills necessary to read Latin as the Romans wrote it, and to consider the historical and cultural implications of their language and literature in contrast to our own. Students also read longer passages of connected Latin prose.

## **CLA410 Latin III (History)**

major elective | grade: 10  
prerequisite: Latin II  
co-requisite: Latin History

By combining the study of history and third-year Latin, this course affords students a unique opportunity to immerse themselves in interdisciplinary study. The centerpiece of the course concerns the immediate events that brought the Roman Republic to an end. By reading Caesar's account of the Civil War (*De bello civili*) and Cicero's letters describing the same events, students become intimately familiar with the only primary documents that have survived from this time—documents which every historian of this period must rely upon and know. The reasons for the Republic's demise are set within the overall trajectory of Roman history, beginning with the pre-monarchic

period. However, students spend most of the year studying the rise of the Roman Republic, its constitution and the ethos of its ruling class.

In Latin III, students become familiar with the rhetorical style of Cicero by translating his first oration against Catiline (*In Catilinam I*). From March through the end of the year, students study the Roman imperial period, the rise of Christianity, the proto-states of Western Europe and their evolution into distinct nations up to the year 1100, concentrating on England and France. While analyzing the reasons for the collapse of the empire in the West and the historical conditions that created the medieval world, students read excerpts from relevant Latin texts of Augustus Caesar, the Gospel of Matthew, Tacitus, Lactantius, Orosius, Jordanes, Gregory of Tours, Einhard, and Fulcher of Chartres. This assortment of primary Latin texts allows students to discover the evolution of the Latin language, as well as the refocusing of human concerns from a Classical to a medieval perspective.

## **CLA420 Latin III (Literature)**

major elective | grades: 9, 10, 11, 12  
prerequisite: Latin II

Students who love myths and legends will be amazed at their ability to move into the regular reading of Latin at level three. Latin III Literature focuses on Ovid's works: *The Metamorphoses*, *The Amores*, and *The Heroides*, while selections from additional authors, such as Horace and Cicero, may be included, as well. Ovid appeared at an important juncture in Roman literary history, coming into his prime after Horace, Vergil and Catullus had died, and just as the Roman empire was taking form. Ovid's magnum opus, *The Metamorphoses*, will lead students through Greek myths and ancient legends in the epic meter of dactylic hexameter. In Ovid's *Amores*, his shorter poems written in elegiac couplets, he takes on a persona who is struggling with various aspects of love, including rivals and rejection. *The Heroides* is a series of letters by women characters from mythology to the men who rejected them. At each stage, students will examine the nature of language, the meaning of words, and the nuance of the poetic. Alongside learning new grammatical constructions, literary

devices, and storytelling techniques, students will explore the history and social context of the period and consider how our readings live today in the world of art, music, poetry, and current events.

### **CLA510 Latin IV: Advanced**

major elective | grades: 10, 11, 12

prerequisite: Latin III – History or Literature

In this course, we will focus on Vergil's *Aeneid* as a literary, historical, and philosophical text, and will discuss such topics as the nature of epic and the use of symbolism in poetry. While continuing to refine their skills in translation, use of meter and knowledge of literary devices, the students will also consider the *Aeneid* in its role as heir to Greek literature—and as seminal to the literature and thought of Western Europe since the Roman period. Students will also produce a film for Classics Day.

### **CLA610 Latin V: Advanced**

major elective | grade: 11, 12

prerequisite: Latin IV

Students will read, discuss and write on a variety of Roman authors and topics, chosen in consultation between the continuing Latin IV students and the teacher. Topics include Roman comedy or law and poetry. Roman comedy, for example, translates Plautus' *Menaechmi*, the story of identical twins separated in infancy. Law and poetry explore the same cast of historic persons in both a scandalous legal case conducted by Cicero, and poetry written by Catullus. Attention will be given to social context, to its historical and cultural background and to literary interpretation. On Classics Day, Latin V students stage a Roman triumph, having first read about triumphs in ancient prose and poetry. Other projects will be developed in consultations between teacher and students.

## COMPUTER SCIENCE + DIGITAL MEDIA

The Computer Science and Digital Media Department provides coursework rich in opportunities for building fundamental skills and exploring programming, robotics, electronics, and digital design. Our programming language of choice is the widely-used Python, a favorite for introductory courses in high schools and colleges due to its gentle learning curve. Additional levels of programming offer our student programmers a substantial forum for learning the skills and techniques necessary for sophisticated large-scale projects. Digital Media coursework at GFS, combining technology and design, provides students with the opportunity to develop design skills and explore the creative potential of technology, using with the suite of offerings associated with the Adobe Creative Cloud. *The department revises its courses every year to account for student interest and the dynamics of this rapidly changing field.*

### CS111 Robotics

minor elective | grades: 9, 10, 11, 12  
(one semester)

This fun one semester, no-homework minor elective uses robots to introduce students to the intersection of computer programming and mechanical/electronic devices. Students will assemble robots and then learn to program them to perform tasks, ranging from simple (moving forward, turning on a light, etc.) to complex (finding and retrieving an object, playing soccer, etc.). Most units culminate in an exciting challenge: teams of students try to get their robot to accomplish a task (e.g., robot bowling, relay races, tug of war) more effectively than the other teams. No previous experience in robotics or programming is necessary. Students signing up for Robotics should request their preferred semester, first or second. **Enrollment limited to 12 students per section.**

### CS130 Computer Science 1: Introductory Programming

minor elective | grades: 9, 10, 11, 12

This full-year minor elective seeks to introduce students to computer programming. We will begin the year by learning Scratch, a programming environment that makes it easy to create an animated story or an interactive game. Scratch allows students to learn fundamental programming concepts in a simple drag-and-drop context.

After Scratch, the remainder of the year will focus on learning Python, a programming language used at many colleges and high schools as their

introductory language. The learning curve for Python is gentle, so students learn the basics quickly and produce simple programs easily

Students will progress to more advanced projects, such as interactive games, card games and casino simulations.

No previous experience is necessary. This class typically has little to no homework and is pass/fail.

### CS100 Introductory Programming: Girls Who Code

minor elective | grades: 9, 10, 11, 12

This Girls Who Code section of Introductory Programming (see course description above) will also include meetings with women in the field to discuss their work in technology.

**No previous experience is necessary.**

#### A NOTE ON INTRODUCTORY PROGRAMMING: GIRLS WHO CODE

*To encourage girls to study technology, we offer this "girls only" section of Introductory Programming. This section, which has been offered previously, reflects our desire to address the gender gap in technology and engineering.*

## **CS140 Computer Science 2: Object-Oriented Programming**

minor elective | grades: 10, 11, 12  
prerequisite: Computer Science 1 or by  
permission of instructor

This full-year elective course builds on the skills developed in Computer Science 1. The course continues to use Python to examine more advanced topics in programming. The class will explore topics such as abstraction, recursion, hash tables, and object-oriented programming. This class also serves as a brief introduction to the concept of algorithms, exploring sorting algorithms and program run-time. Students will spend a mixture of their time learning concepts and working on their own programs, either in collaboration or alone.

## **CS150 Computer Science 3: Algorithms & Computer Organization**

minor elective | Grade: 11, 12  
prerequisite: Computer Science 2 or  
permission of instructor

This course is split into two units. The first unit consists of exploring algorithms and data structures with Java, an object-oriented programming language. This will introduce students to the language that is featured on the AP exam (GFS does not require or discourage students from taking AP exams). The second unit introduces students to computer organization, or how a computer works. They will learn about digital logic and explore how transistors interact by modeling them with Arduino boards. They will also be briefly introduced to low-level languages such as C and Assembly.

## **CS180 Mobile App Development**

minor elective | grades: 9, 10, 11, 12

This course introduces students to programming technologies, design and development for mobile device applications. Topics include accessing device capabilities, industry standards, operating systems, and programming for mobile applications using an OS Software Development Kit (SDK). Students will learn how to design mobile interfaces, how to use libraries to build applications that have the proper look and feel,

how to use table views, and how to design and manage user input. Upon completion, students should be able to create basic applications for mobile devices.

## **CS190 Electronics Design Workshop**

minor elective | grades: 10, 11, 12  
prerequisite: Computer Science 1 or Robotics,  
or by permission of the instructor

This is a hands-on, project-based class that introduces students to digital electronics technology. Digital electronics is the foundation of devices such as cell phones, laptops, digital cameras, robotic devices, and more. Students will analyze, design and build digital electronic circuits and develop applications and devices to accomplish defined tasks. The course will lead students through the analysis of a task that can use electronic controls, or a problem that can be solved by electronic controls, and then students will design a device that can perform the task or solve the problem.

**-NEW-**

## **CS155 Computer Science Programming Capstone**

minor elective | grades 11, 12  
prerequisite: Computer Science 3 or  
departmental approval

The Capstone course in the Computer Science/Digital Media department is the culmination of the academic courses we offer in programming. It builds on the concepts and skills covered in the Computer Science 2 and 3 programming classes. This course will focus on larger projects and, in many cases, students will work in teams. Students will identify a complex problem or project that requires them to apply, and extend, their programming skills and knowledge and to produce an appropriate programmatic outcome. Based on student interest, so students in the course will drive the content of the class.

**-NEW-**

## **CS171 Digital Design I**

minor elective | grades: 9, 10, 11, 12

This introductory survey class is open to students eager to explore the tools and technology fueling the creative economy.

Students will learn how to use text, graphics, video, and interaction design to express ideas through a variety of digital media. Topics include user-centered design (user interface and user experience), visual communication, typography, digital illustration, motion graphics, and digital humanities. Students will gain introductory experience with Adobe Creative Cloud tools, including Illustrator, Photoshop, InDesign, After Effects and Adobe XD, as they explore and apply digital design methodologies and practices. Students will be able to use and apply their skills in course work and projects throughout the curriculum and in clubs and student publications such as *Earthquake*, *Polyphony*, and *Anno* (yearbook).

### **CS160 Web Design & Development I** minor elective | grades: 9, 10, 11, 12

This course covers the basics of designing websites, as well as web development using the HTML and CSS authoring languages. Students learn about the creative design of websites, including the strengths, constraints, and limitations of this medium of communication. Students will code their own web pages from scratch, using the latest web standards and tools, such as HTML5, CSS3, coding software, wireframing, and browser tools and plug-ins for web developers. Students complete several assignments and projects to master the course objectives, including a final project to create an original design for a microsite on a topic of the student's choice. To support their work, students complete readings from the course texts and selected articles; they share their original work and critically reflect on real-world examples.  
**Enrollment limited to 12 students per section.**

### **CS170 Web Design & Development II** minor elective | grades: 10, 11, 12 prerequisite: Web Design & Development I or permission of instructor

This advanced course builds upon the principles and skills acquired during the Web Design & Development course. Students learn more advanced CSS3 coding techniques to create web pages employing the latest trends and standards in web design. Topics include HTML5

semantic tags, CSS selectors and combinators, text styling and embedded fonts, special effects, transforms, transitions and animations, CSS3 layout techniques, responsive web design, and a brief introduction to jQuery plugins. Using text editing software and developer tools, students complete several smaller assignments to master the course objectives. In addition to the course text, students complete readings and participate in class discussions on topics such as page and site design, color schemes, fonts, imagery, and site management. Students incorporate all they have learned to produce a final project: to design and implement a functional site for a real client using Wordpress or another content management software.  
**Enrollment limited to 12 students per section.**

### **ART870 Mixed-Media Animation** minor elective | grades: 10, 11, 12 prerequisite: Foundation (Art)

This course introduces students to a variety of traditional and contemporary techniques in animation. Looking at examples of animations in art and film, as well as nonfiction topics such as science and history, students will learn hand-drawn, stop-motion and digital methods for making their own animations. Story building will be key in developing ideas for production. Students will also learn to edit the animations and incorporate sound effects and music. Throughout the course, students will produce a series of short animated sequences using a variety of techniques, themes, and media as they explore how these choices impact their stories. These works will build to one or more major projects. An historical overview and international perspective are provided through film screenings and group discussion, and students will review and discuss current trends in animation.  
**Enrollment limited to 12 students per section.**

## ENGLISH

Students engage in lively dialogue with texts in English classes at Germantown Friends School. Close critical reading of novels, poems, plays, and essays invites students to develop an appreciation for literature, and the classroom provides a forum for exploration and expression of ideas. Through thoughtful analysis, creative response and reflective writing, students grapple with the perspectives and ideas of a diverse and ever-expanding repertoire of authors. Students contemplate a range of issues introduced within texts and consider the larger social implications of their reading. We also ask them to consider historical context. Writing is at the center of everything we do, from personal and analytical essays, short stories and poems to chapbooks, graphic novels, manifestos, scenes, podcasts, and newspapers. Along the way, students gain increased syntactic flexibility and precision through the study of grammar, vocabulary, and rhetoric. A hallmark of the department is the Essentially English program in the spring of tenth, eleventh and twelfth grades, which allows students to elect innovative day or nighttime classes. Our program cultivates writers and readers who are joyous, reflective, honest and artful.

**Graduation Requirement Note:** Students must complete four years of major coursework to graduate.

### Note on Program for Grades 10-12:

- September to March: English is devoted to the required courses at each grade level.
- April to May: The English Department shifts to elective courses in its Essentially English program for students in grades 10-12.
- Essentially English courses can be elected by adults in the community, including parents. Some courses are held in the evening (from 7-9:30 p.m.).

### **ENG310 Exploration of Identity**

required major | grade: 9

Ninth grade students study works of literature that explore issues of identity. Included in the curriculum: a short story unit, *Another Brooklyn*, *The Laramie Project*, *Persepolis*, a Shakespeare play, and *Dr. Jekyll and Mr. Hyde*. Vocabulary study is based on words drawn from the texts. Teachers emphasize expository and creative writing with three substantial written projects each semester. Through active reading, students learn to support their arguments with carefully chosen textual examples and consolidate their knowledge of MLA format, style, and correct punctuation by drafting and revising their essays. In keeping with the theme of identity development, students plan a one-day experience project in which they explore a hobby or potential career and write an essay about that experience. Concurrent with our critical and structural study of short stories and poetic forms, students write their own short stories and various poems, compiling a writing portfolio by the year's end.

**-NEW-**

### **ENG650 Style Fundamentals**

required minor | grade: 9  
(one semester)

In addition to their regular English classes, students in ninth grade will study key elements of style and grammar during one half of the year. Topics include, but are by no means limited to, clear reference, phrases and clauses, subordination, syntax, and clarity. Coursework will be supplemented by written assignments and practice using IXL, an online learning tool.

### **ENG410 The Poetry of Language**

required major | grade: 10

Students in sophomore English examine the ways that writers create meaning through imagery and language, as well as the ways that writers are created by their own worlds. Students read work by authors such as Sophocles' *Oedipus Rex*, Mary Shelley's *Frankenstein*, William Shakespeare's *Macbeth*, Zora Neale Hurston's *Their Eyes Were Watching God*, Madeline Miller's *Circe* along with poetry by diverse authors. Dramatic and

oral presentations are particularly important; students memorize and perform choral odes, soliloquies, blues songs, and dramatic scenes. Formal and informal writing provide frequent opportunities for students to work on usage and coherence in their own creations. An emphasis on drafting writing, peer-editing, and thoughtful revision develops student voice and precision of expression. Vocabulary lists are drawn from the reading.

### **ENG510 Literary Analysis, Poetics, and Composition – Part I: Advanced required major | grade: 11**

Junior English classes focus on authors whose innovative writing challenged the status quo and continues to resonate today. Through close reading, study of form and content, and investigation into historical context, we cultivate student engagement. Class discussions invite students to delve into challenging texts and present their ideas and interpretations to their peers. Books studied include F. Scott Fitzgerald's *The Great Gatsby*, Nella Larsen's *Passing*, Jean Toomer's *Cane*, and Yuri Herrera's *Signs Preceding the End of the World*. Shorter texts include Wilde's play *The Importance of Being Earnest*, Romantic poetry (focusing on William Blake's *Songs of Innocence and Experience*), Franz Kafka's *Metamorphosis*, and stories in Yiyun Li's collection, *Gold Boy, Emerald Girl*. As they read, students learn about parallels in the visual arts, specifically photojournalism, modernism, Romanticism, and expressionism.

Writing is central to the course: Students compose informal reading responses, formal analytical essays, poetry, narratives, and creative nonfiction. They undertake an intensive study of the definition essay, including examples by Langston Hughes, Gloria Anzaldúa, David Sedaris, Chang-Rae Lee, Rebecca Solnit, and Margaret Atwood. Through revision, writing conferences and workshops, we encourage students to sharpen their writing skills, experiment with style, and develop an academic voice of their own.

### **ENG610 Literary Analysis, Poetics, and Composition – Part 2: advanced required major | grade: 12**

Advanced Literary Analysis, Poetics, and Composition (Part 2) is an intensive course in the analysis of literary texts and writing. The literature frames issues of aesthetics and politics in a global historical context, emphasizing major movements such as realism, modernism and postmodernism, as well as major historical events such as the transatlantic slave trade, and eras including colonial and postcolonial. The course covers a range of genres from modern and postmodern fiction and drama to poetry and the literary essay.

Students will examine the ways in which identity is formed through language, the politics of self and other, and the tensions that exist when an author attempts to write both artfully and meaningfully. Literature may include *Homegoing*, Yaa Gyasi; *Dubliners*, James Joyce; *Song of Solomon*, Toni Morrison; a play by William Shakespeare; and essays by an array of writers that may include Claudia Rankine, Jamaica Kincaid, Ta-Nehisi Coates, Toni Morrison, James Baldwin, and David Foster Wallace.

As part of the course of study, students will attend the performance of a locally produced play. Writing assignments designed to build skills and explore important concepts include in-class essays, an expository personal essay, a comparison paper, a paper using secondary sources, an essay based on a moral dilemma, a creative work of prose, a character analysis, and an original poem. Other requirements include vocabulary tests on words drawn from each book and substantial memorization.

**-NEW-**

### **ENG700 Poetry Workshop minor elective | grades: 10, 11, 12**

In Poetry Workshop, we will work together to create a writing practice for ourselves and each other, placing composition and the development of literary voice at the center of our work as we explore the aesthetic, political, and transformational possibilities of language.

Students will produce new work for each class session: experimentation with poetic form will be integral to our studies. As we read contemporary poetry and the poetry of previous centuries aloud, we will together observe successful elements of composition. Students will master a vocabulary for discussing and analyzing poetry. As we learn about ourselves and each other as readers and writers of poetry, we will construct a portfolio of a year's worth of work, organize several readings/events, and seek out opportunities for growth and exposure to poetry in the Philadelphia area. We will also hold ourselves accountable to GFS as a poetic community, highlighting poetry and fostering poetic connections between disciplines and divisions.

**-NEW-**

## **ENG430 Narrative Journalism**

minor elective | grades: 10, 11, 12

Also referred to as literary, creative, or longform journalism, narrative journalism can be defined as “employing storytelling techniques to convey news.” Using the classic tools of fiction writers—character, plot, conflict, and theme—to tell factual, nonfiction stories, this style of journalism is most commonly found in publications such as *The New Yorker*, *The Atlantic*, *Harper's*, and *The New York Times Magazine* (among others), where average article lengths are upwards of 2,500 words. This course will focus on story concept, character development, and reporting and research practices as students exercise their narrative voices by writing in-depth stories on topics of their choosing. They will learn to cultivate ideas, hone descriptive-writing skills, and play with tone as they craft compelling pieces to deeply engage readers. Students will read and discuss many examples of longform journalism, as well as share their own writing with their peers in a workshop setting.

## HEALTH EDUCATION

The health of our bodies, minds and spirits informs all that lies before us in life. The goal of the Health Education Department is to lead students in understanding that our individual health does not stand alone, but is integrated into every aspect of our lives. Our aim is to educate students on the merits of clear communication and the clarification of values. We also show them how to access credible health information. Health Education courses are developmentally appropriate and cover a range of health topics, including sexuality, mental health, mindfulness, safety, alcohol and drug use, nutrition and healthy eating. Health education is interdisciplinary by its very nature—we continually collaborate with both the science and physical education departments.

**Graduation Requirement Note:** One semester of the minor course Health Education 10 is required in grade 10. A full year of the minor course Life Issues is required in grade 12.

### **HEA401 Health Education 10**

required minor | grade: 10  
(one semester course)

Health Education is semester long course focused on decision-making and information gathering on the topics of mental and emotional health, drugs, and sexuality. We begin with a mindfulness-based stress reduction program, where together we explore and practice different forms of meditative practices to cultivate our ability to pay attention to the present moment with the hope of allowing us to make more thoughtful decisions. We also discuss stress and our stress reactions, how we experience and process the world through our body, thoughts, and emotions, and ways to cultivate gratitude in our everyday lives. Another main focus of the mental health unit is how to recognize when someone needs help and how to seek help for yourself or others. Sleep, addiction, depression, anxiety, and disordered eating are also addressed. We then examine substance abuse both at a societal level and also the individual consequences of choosing to use, including addiction. We explore drug-related issues through various lenses, including current research, statistics, media, societal norms and direct and indirect pressure. Sexuality is presented in a holistic manner, and the topics include sexual identity, gender and society, reproductive health, and building and maintaining healthy relationships. All topics in the course are explored through information gathering, analyzing of media, personal reflection and discussion.

### **HEA600 Life Issues**

required minor | grade: 12  
(yearlong course)

The objective of the Life Issues course is to provide students with the information and tools they need to navigate their senior year and the transition into the next phase of their life, including college. The course is coordinated with Advisory once a cycle all year. A portion of the course is devoted to college advising and grade advising. The remainder focuses on a list of topics that the students help generate, including personal finance, mental health and mood disorders, happiness, stress, basic car maintenance, resume writing and business communications, personal safety, healthy romantic relationships, maintaining a strong relationship with parents and family, buying and preparing food, physical intimacy, sexual consent, bystander intervention, contraception, sexually transmitted infections, sexual identity, social media, and alcohol and drug use. We recognize that many parents and caregivers are also reflecting on how to prepare students for their lives after GFS.

## HISTORY

In our history classrooms, students and faculty explore and challenge ideas together, building on the foundational Quaker belief in continuing revelation. Examining differences and empathizing with multiple perspectives are central to this process. We endeavor to help students make meaning out of a variety of sources through thoughtful questioning, close reading, analysis, and research. Students and faculty practice communicating ideas with clear, direct expression supported by evidence. Creating historical consciousness—the consciousness that people in the past had different values, assumptions and worldviews from people in the present—is foundational to our work together. Our hope is to gain a deeper sense of our own identities, develop moral understanding, and foster engaged citizenship that will contribute positively to the world.

**Graduation Requirement Note:** Students must complete 3 years of major coursework in History to graduate, including Comparative Cultures, Ancient & Medieval Civilizations or Latin History, and United States History: Advanced.

### **HIS310 Comparative Cultures**

**required major | grade: 9**

Students of Comparative Cultures will gain background knowledge in three cultural areas: China, Ghana, and Mexico. They will be encouraged to appreciate cultures other than their own and to discern those qualities that are universal and those that are unique. An examination of value systems, government legitimacy, political and social movements, and problems of modern nation building will help them to apply their background knowledge to current events. Students will also gain experience in analytical thinking and the organization of large quantities of material through writing short essays, essay tests, and one long-term research paper. Emphasis will be placed on learning to support generalizations with solid evidence and verifying sources. One quarter-long unit will be devoted to guiding each student through a step-by-step process of research that begins with crafting a question on a topic of their choice and ends with writing a sound research paper.

### **HIS420 Ancient and Medieval Civilizations**

**required major | grade: 10**

The course examines the evolution of the civilizations of the Middle East and the Mediterranean basin, from their origins in the ancient world. The analysis of how societies and civilizations function is a key component of the course. The course also includes discussion of ancient Mesopotamia, Egypt, Greece, Rome,

Judaism, Christianity, Islam, and topics of student interest from the ancient and medieval time periods.

Emphasis will be placed on writing and on analyzing evidence to support historical claims. To that end, students' intellectual skills will be honed by the critical reading of primary and secondary sources, the development of historical imagination, and the construction of well-reasoned arguments both on paper and in classroom discussion. Students will spend one 5-week unit writing a sound research paper on a topic of their choice.

**—OR—**

### **HIS410 Latin History**

**required major for students concurrently enrolled in Latin III (History) | grade: 10  
co-requisite: Latin III (History)**

By combining the study of history and third-year Latin, this course affords students a unique opportunity to immerse themselves in interdisciplinary study. The centerpiece of the course concerns the immediate events that brought the Roman Republic to an end. By reading Caesar's account of the Civil War (*De bello civili*) and Cicero's letters describing the same events, students become intimately familiar with the only primary documents that have survived from this time—documents which every historian of this period must rely upon and know. The reasons for the Republic's demise are set within the overall trajectory of Roman

history, beginning with the pre-monarchic period. However, students spend most of the year studying the rise of the Roman Republic, its constitution and the ethos of its ruling class.

In Latin III, students become familiar with the rhetorical style of Cicero by translating his first oration against Catiline (*In Catilinam I*). From March through the end of the year, students study the Roman imperial period, the rise of Christianity, the proto-states of Western Europe and their evolution into distinct nations up to the year 1100, concentrating on England and France. While analyzing the reasons for the collapse of the empire in the West and the historical conditions that created the medieval world, students read excerpts from relevant Latin texts of Augustus Caesar, the Gospel of Matthew, Tacitus, Lactantius, Orosius, Jordanes, Gregory of Tours, Einhard, and Fulcher of Chartres. This assortment of primary Latin texts allows students to discover the evolution of the Latin language, as well as the refocusing of human concerns from a Classical to a medieval perspective.

### **HIS610 United States History: Advanced**

required major | grade: 11, 12

United States History is a survey course that examines the development of the United States as a cultural, political and economic entity from its 17th-century European and African antecedents to the recent past. Heavy emphasis is placed on primary sources through numerous documents and images collated by the faculty. Students are also given recent books by historians, which change from year to year, together with selected scholarly articles. Students are required to express their understanding through a combination of intensive class work, papers, tests, debates, presentations, and simulations.

## **ADVANCED TOPICS IN HISTORY**

major elective | grade: 11, 12

Students electing to pursue these topics must select both a fall and a spring course to create a year-long history major that allows them to delve into two different areas of interest for one semester each.

### **FALL ELECTIVES**

–NEW–

#### **HIS471 African American Studies: Advanced**

This course will take a holistic approach to analyze African American heritage and the pressing issues that impact the African American community today. We will commence with a thorough investigation of contemporary issues that face the African American community, ranging from identity to the disparate criminal justice system. Our study will shift to a review of African empires such as Ghana, Mali, and Songhai. This will enable us to gain a concrete understanding of African rituals, customs, arts, religion, and social organizations. Students will be able to trace the retention of African culture as millions of slaves were forced into bondage through the middle passage to be seasoned in Caribbean plantations. African culture and the slave experience will be examined through as we explore the literary works of Olaudah Equiano, Phyllis Wheatley, George Moses Horton, Jean Toomer, James Baldwin, Amiri Baraka, and Sonia Sanchez. We will explore the same themes in music, from ragtime to hip-hop, and in 20th-century film, with particular attention to how the stereotypes rooted in D.W. Griffith's *Birth of Nation* reveal the shifting societal and gender roles of African Americans over time.

–NEW–

#### **HIS461 The Making of the Modern World: Advanced**

The “Age of Reason” spans the era from the Reformation and Scientific Revolution in the 16th and 17th centuries to the Enlightenment of the 18th century. The changes brought about during this “early modern” period shaped the mindset of the modern age from the American and French

Revolutions to the present. In this course, we will study the events and ideas that have contributed to our current world, focusing on the political, social, and intellectual developments that have formed the basis for democratic societies.

### **HIS431 United States Government & Civics: Advanced**

This course will cover the structure and operation of the modern United States government. It will be rooted in the United States Constitution and the three branches of government described therein but will extend far beyond that. Students will also explore ways that citizens can effect change and will consider how they can get involved in governance. Topics may include presidential power, the two-party system and its machinations, campaigning, how committees work within Congress, lobbying and interest groups, gerrymandering, the creation and jurisdiction of administrative agencies, the federal courts, federal civil rights including those included in the Bill of Rights and the Fourteenth Amendment, political action committees (PACs), and how power is divided between the federal and state governments.

### **HIS451 War and Peace: The Modern Middle East: Advanced**

This course will examine the conflicts and politics of the Middle East in the 20th- and 21st-centuries. Our studies will include history and geography of the region, focusing on the breakup of the Ottoman Empire, the mandate system, and the lead-up to the UN partition of Israel and Palestine. Students will grapple with multiple perspectives in that complex conflict, as well as others, and examine peace negotiations. The ongoing conflict in Syria will also be studied, as well as other case studies based on student interest and current events. The course will prioritize analyzing the causes and effects of current challenges, understanding the perspectives of diverse stakeholders, and considering possible local and international solutions. US involvement in Middle East conflicts in recent decades, with an eye towards the US government's strategy, may also be discussed.

## **SPRING ELECTIVES**

**-NEW-**

### **HIS432 Europe: World War II and Beyond: Advanced**

In this course, we will explore the political and social developments in Europe before, during, and after the Second World War. We will study how the lingering effects of the First World War led to continued conflict and how ideological and geopolitical differences split Europe between the United State and the Soviet Union after the war ended. We will also look at the rise of liberal democracy in the West, the formation of the European Union, the fall of Communism, and the current rise of right-wing nationalism.

**-NEW-**

### **HIS482 Genocide and Human Rights: Advanced**

In this course we will work to understand the historical roots, immediate causes, implementation, and the aftermath of acts of state-sponsored violence and genocide. The term genocide emerged near the end of WWII and was further defined by the United Nations Genocide Convention as "acts committed with intent to destroy, in whole or in part, a national, ethnic, racial or religious group". Case studies may include the Holocaust, Rwanda, Cambodia, Armenia, an examination of indigenous peoples in the Americas, and the Rohingya among others. Studying both primary sources and historians' interpretations of the events, we will work to comprehend genocide as both a personal human experience and also as a brutal form of government policy.

Our study will require considering the plight of victims, their various forms of agency through acts of resistance, perpetrators, and complicit nature of bystanders. Due to the inherent nature of genocides content covered in this course will be difficult and often times disturbing, but necessary to foster empathy and deeper understanding of the atrocities. As citizens of the world the greater understanding we have of past genocides, the better equipped we are to identify, prevent and respond to future genocides and mass atrocities.

**-NEW-**

### **HIS472 History of Science: From Darwin to DNA: Advanced**

This course will explore the historical development of the biological sciences over the past two centuries. Topics to be studied include: Darwin and evolutionary theories of the origin of species, including religious objections and social applications; materialist theories of heredity and development; eugenics and the application of scientific theories of genetics to human social issues; and the rise of molecular genetics, the biotechnology industry, and cloning and gene editing. Students will learn about how current scientific issues affect the political process, business decisions, societal norms, and their day-to-day lives.

### **HIS462 Modern U.S. Political Ideologies and Issues: Advanced**

This course will focus on the ideologies of the modern Democratic and Republican parties and the central political debates in the modern United States. The purpose of this course is not to debate who is right, although we will carefully examine facts and arguments, but rather to understand the nuanced motivations and arguments underlying ideologies and policy preferences. In addition, we will explore our own political identities and the various factors that play into their formation. Specific issues for study may include civil rights, immigration, foreign policy and national security, government spending on entitlement programs, gun rights, the national debt, education, energy and the environment, abortion, regulations and the free market, and tax policy.

## JUNIOR/SENIOR SEMINARS

In addition to the departmental offerings, students in their junior and senior years may choose from among the following course offerings.

–NEW–

### **SEM100 Design Thinking for Social Impact**

major elective | grades: 11, 12

In this course, students will apply the principles of design thinking to the world around us, using a human-centered approach to partner with Germantown community organizations to solve local challenges. Operating from a mindset that is solution-focused and action-oriented, students will learn to employ design thinking's five basic actions: to empathize, define, ideate, prototype, and test. As they collaborate with neighborhood partners, they will gain confidence not only in the innovation process, but also in their creative potential and leadership abilities. The class will begin with a crash course in design thinking to familiarize students with the design thinker's toolkit, exposing them to a new, multi-disciplinary approach to asking questions, applying knowledge, and finding creative solutions to "real world" problems. Students will develop skills as ethnographers, visual thinkers, strategists, and storytellers through a combination of discussions, readings, and collaborative, team-based challenges. Potential community partners may include Historic Germantown sites, Pennsylvania School for the Deaf, and the Germantown Special Services District. The class will keep detailed journals to track their progress, and design and maintain the content of a blog or website to record their projects. In Design Thinking for Social Impact, students will hone their critical thinking, leadership, communication, and empathy skills while connecting more authentically with the Germantown neighborhood.

–NEW–

### **SEM110 Digital Humanities**

major elective | grades: 11, 12

We live in the age of communication; we navigate a sea of information. This class will introduce students to the key concepts and concerns animating the growing field of Digital Humanities. Digital Humanities sits at the intersection of computer science, technology, and the humanities. Imagine a mash-up of your favorite English or history courses with math and Introductory Programming. What would it look like to use one line of code to analyze all the papers you've written to uncover the patterns and growth of your prose? How does engaging with seemingly incongruous materials develop new critical thinking practices for your academic journey? Digital Humanities invites us not only to engage in humanistic inquiry in a digital environment but also to think about digital environments from a humanities perspective. This course will teach students about new digital techniques for research and analysis and ask them to reflect on the relationship between such tools and the critical role of culture, gender, race, and power. Students will cultivate skills related to research practices, textual and data analysis, critical thinking, creative expression, and persuasive writing. This course is intended to bridge topics related to digital design, information sciences, media studies, and public history. Digital Humanities, which is interdisciplinary by nature, will make extensive use of the GFS Archive and Library as resources and loci of study and inquiry.

–NEW–

## **SEM120 Playwriting Workshop**

major elective | grades: 11, 12

Theatre is vital for society. Theatre can entertain, but it can also both respond to our times and affect change. In this seminar, students will come together to study and explore the craft of playwriting and the art of theatre. Through the study of script analysis and dramaturgy, this cohort of workshop students will delve into how playwriting works—the rules of this form. Students will become practicing writers, working with writing prompts, exercises, and feedback sessions. Students, becoming playwrights themselves, will ultimately write a one-act play and create work(s) together as an ensemble. As the class shifts to production of student work, in-class topics will include how to cast your work, how to work with actors in rehearsal on a new script, and how to navigate feedback from the audience. The culmination of this course will be the presentation of student work.

## **SEM130 World Religions**

major elective | grades: 11, 12

In the first semester, this course will guide students in an appreciation of Judaism and Christianity by exploring the centrality of their Scriptures in the respective life and practice of these faith traditions. Beginning with a study of the history of the Jewish people as recounted in their sacred texts, students will learn how the Jewish scriptures—Torah, Prophets, Writings—took shape and how the Jewish people came to place them at the center of their religious practice. Students will likewise consider how these scriptures, but especially the Torah, are read and interpreted today. In the second half of the semester, students will learn about the origins of Christianity and the evolution of Christian scriptures in that context. Focusing on the Letters of Paul and the four Gospels, students will explore the New Testament and learn the ways in which Christians understand Jesus Christ to be the fulfillment of “the law and the prophets,” reading the Jewish scriptures as the Old Testament and bringing with the New Testament to constitute the Christian Bible. Students will study the various ways different

Christians today use, interpret, and are guided by the Bible.

In the second semester, students will be guided in acquiring an understanding about the beliefs and practices of Hinduism, Buddhism, and Islam. In our effort to come to an understanding of these religious traditions, we will approach them with reverence and, in so far as possible, enter into their spiritual worlds through the eyes and hearts of their adherents. To this end, while studying the origins and history of each religion, we will endeavor to discover whatever values and commitments they exhibit by acquiring a familiarity with their respective scriptures, beliefs, and ritual practices. A special feature of this seminar will be field trips, when practicable, to local religious sites where followers of these three belief traditions gather. Such visits will allow us to observe the different forms of prayer and worship and to hear and talk with the spiritual leaders of each religion first hand.

–NEW–

## **SEM140 You Can Hear the Whistle Blow: The Literature of Slavery, The Abolition Movement, and the Underground Railroad**

major elective | grades: 11, 12

This seminar will focus on works of literature that explore slavery, the abolition movement, and the Underground Railroad in the antebellum United States. We will explore both works written during the time of slavery and post-bellum works, from the personal testimony of Frederick Douglass to Colson Whitehead’s brilliant postmodern novel, *The Underground Railroad*. This seminar will also provide the opportunity to study how Germantown Friends School and the Germantown Monthly Meeting of the Religious Society of Friends were involved in the history of the abolition movement, originating with the 1688 Germantown Quaker Petition Against Slavery. We will also learn how Germantown was an important site, both on the Underground Railroad and also in the lettered culture of abolitionism. Many vitally important black intellectuals, writers, journalists and spiritual leaders worked, wrote, and advocated in Philadelphia and in Germantown. The course will

thus connect the local public sphere to a larger mapping and charting of the abolition movement, giving students an enhanced understanding of their own relationship to this history, particularly the intersection between literature and historical scholarship.

## ADDITIONAL OFFERINGS

### **SEM960 Applied Economics**

major elective | grades: 11, 12

Demand has an inverse relationship to price and quantity. How does this important concept as well as myriad other micro and macroeconomic metrics play out in the real world? This course seeks to see identify, synthesize and evaluate the microeconomic concepts in and around Philadelphia. Students will work in teams to identify problems in our community that can serve as economic opportunities and also fulfill the needs of our neighbors. They will develop and test their solutions to these problems to determine the feasibility and growth potential. Students will also compete in a simulated global economy, using the Virtual Enterprise International global business simulation, which is project-based collaborative learning that develops such 21st-century skills as entrepreneurship, problem solving, communication, and using technology to explore macroeconomic concepts. Students will develop and practice job skills, refining their resume and cover letter and experiencing traditional and performance-based interviews. Students will create a personal budget, deal with virtual “unexpected life issues” and pay their bills throughout the year utilizing their virtual bank accounts. Students will have an opportunity to lead a department (marketing, sales, accounting, communications, art and human resources) or the firm, as well as work as an associate. Students will compete in the following national online competitions over the course of the year: Elevator Pitch, Product Branding, Human Resource Manual, Business Plan, Company Website, Commercial, Newsletter, and Annual Plan. Students will compete in regional trade show with the opportunity to qualify for the national trade show.

**-NEW-**

### **SEM150 Common Spark**

required minor | grade: 9  
(one semester)

Public speaking through personal narrative. Everyone has a story. In Common Spark, we work to grow as confident public speakers by telling stories inspired by our lives. Using techniques devised by the popular live podcast, *The Moth*, we will build a supportive creative space for sharing stories while learning tools and strategies for public speaking. *The Moth* believes that processing experience through narrative can provide insight and agency; that listening to stories can both widen our perspective and create common ground; that through sharing stories, a community is strengthened. In Common Spark we seek to strengthen our students as individuals within their school community. The course will culminate with each student presenting a five-minute story.

### **SEM950 Exploring Differences and Common Ground: Social Justice Dialogue**

minor elective | grades: 9, 10, 11, 12

The Intergroup Dialogue minor offers students a supportive environment where they engage in “real talk” about issues of race, class, gender, sexual orientation, social identity and power. Intergroup dialogue involves an exploration of the personal-interactional-reflective dynamics among individuals who analyze their social contexts and share their experiences. Students in this class lean into the work of building a learning community comprised of people of different backgrounds and social identities, they commit to sustained, face-to-face, facilitated and confidential conversations, and they engage in analysis and reflection about some of the most troubling issues facing U.S. society and the world in the 21st century. Through the process, students learn about possibilities for transformation and social change, they become leaders in diversity and social justice, and they learn how to design and facilitate Intergroup Dialogue.

## **SEM990 Peer Writing Advisor Training Part 2: Theory into Practice**

minor elective | grades: 11, 12

prerequisite: Peer Writing Advisor Training  
(Essentially English course)

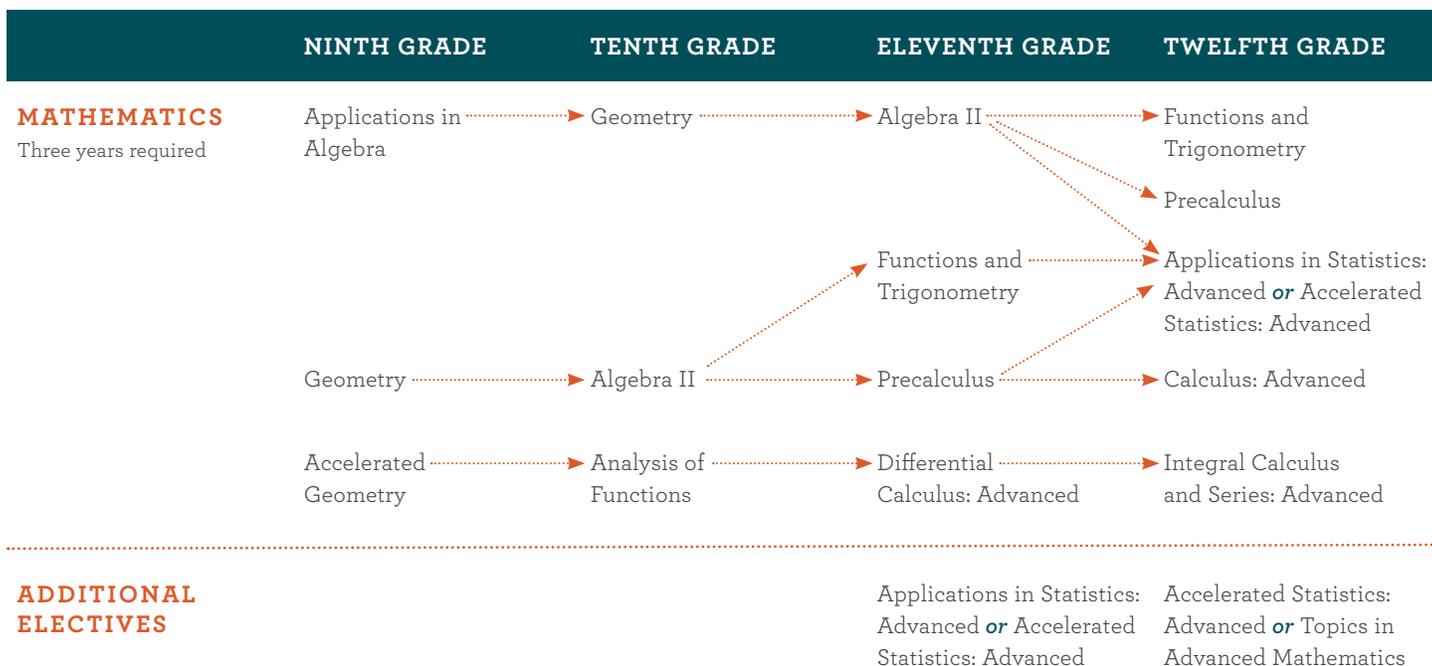
Peer Writing Advisors are students trained to work with other students one-on-one on writing assignments. They believe that writing is communicating. This course expands on the content of the spring training of the Peer Writing Advisors, and translates much of the theory covered in that course into the practical work of being a PWA. During the fall portion of a Peer Writing Advisor's work, more specific questions arise, as well as a desire for deeper knowledge and expertise that would bolster their one-on-one sessions with students. Throughout this yearlong minor, topics will include: how to "read" a school culture to offer a relevant service, the politics of teaching grammar, and how to lead a writing workshop to a group. Relative to the spring training, students receive more direct observation and feedback; students receive more feedback on their own writing from both the teacher and their fellow cohort members; and students learn how to support various types of learners, such as ESL students and students with learning differences. Assessments include committee work, self-assessments, presentations, and publicly available blog entries and writing assignments.

## MATHEMATICS

The math program strives to equip each student with the skills to think logically and analytically and to articulate strategies for solving problems, particularly those related to math and science. We seek to develop a student's understanding of algebra and other mathematical concepts throughout the curriculum. Topics in each subject are explored visually, symbolically, and verbally. Scientific and graphing calculators and various software applications are used as instruments for exploration and deeper understanding. Our aim is to encourage students to become confident in their math abilities and to recognize math as a powerful subject and tool. The standard mathematics progression is rigorous, leading to advanced courses in calculus and statistics for juniors and seniors. In addition, accelerated courses are offered at each grade level, starting in eighth grade. These courses move at a faster pace and explore topics in greater depth and breadth.

**Graduation Requirement Note:** Students must complete three years of major coursework to graduate. Because students progress through the math program differently, there is a range of courses that can be elected to fulfill these three years of required coursework. Please attend closely to information about prerequisites and departmental approval.

- Placement in advanced courses is based on student performance, teacher recommendation, and the approval of the math department.
- Students in an accelerated course who wish to continue on to the next accelerated math class must have the approval of the math department.
- Students who wish to move to an accelerated course must have the approval of the math department and earn an A in the current course.
- A student who moves out of an accelerated course, or who drops math before the requirement is met, must have the approval of the math department.
- The courses Accelerated Geometry and Analysis of Functions can lead to the equivalent of two years of college-level Differential and Integral Calculus. When enrolling in Differential Calculus: Advanced, students must commit to taking the full two-year sequence: typically Differential Calculus: Advanced in eleventh grade, and Integral Calculus and Series: Advanced in twelfth grade.



### **MTH310 Applications in Algebra** can fulfill required major for grade 9

The Applications in Algebra course gives students an opportunity to further explore the connections between algebra topics and the real world. Students build foundational comprehension of algebra concepts and skills as they examine how mathematics can be used to analyze and model the problems around them. Particular emphasis will be placed on constructing methods for exploring what algebra can teach us about topics in social justice, the sciences, and economics.

### **MTH420 Geometry**

can fulfill the required major for grades 9 or 10  
prerequisite: minimum of B- in Algebra I, completion of Applications in Algebra, or departmental approval required

This course in Euclidean geometry includes the study of geometric figures, shapes, angles, parallel lines, similarity and congruence, circles, area and volume, coordinate geometry, some analytic geometry, and some trigonometry. The deductive thought process is emphasized throughout this course and algebraic skills are reviewed and reinforced. Through the process of writing, two-column proofs students construct logical arguments and develop valid conclusions. Students will explore and visualize concepts using dynamic geometric software. The goal of this course is for students to think geometrically and see geometry in the world around them.

### **MTH430 Accelerated Geometry**

can fulfill the required major for grades 9 or 10  
prerequisite: Accelerated Algebra I or Algebra I and current teacher recommendation; departmental approval required

This course takes a strong analytical approach to the study of Euclidean geometry. Progression through this course is broader and more rigorous than MTH420 Geometry. Some topics of study include geometric figures, shapes, angles, parallel lines, similarity and congruence, circles, area and volume, coordinate geometry, and trigonometry. Proofs are emphasized throughout the year to develop strong deductive reasoning. Students will explore and visualize concepts

using dynamic geometric software. Algebra will be used frequently in the development and solving of problems. Through the process of making conjectures and testing hypotheses, students will develop a deeper appreciation of thinking geometrically, as they defend their thought processes.

### **MTH520 Algebra II**

can fulfill the required major for grades 10 or 11 | prerequisite: Geometry

Building from the topics covered in Algebra I, this course guides students through an exploration of linear and nonlinear functions. Students gain fluency in translating between representations of patterns as equations, tables, and graphs. Students also examine function behavior, particularly by exploring transformations and function inverses.

Throughout the course real world applications, problem solving activities and communication projects provide students with the opportunity to demonstrate a deeper understanding of the materials. Students will also use the TI-Nspire, online graphing calculators, and web resources as they explore these topics.

### **MTH530 Analysis of Functions**

can fulfill the required major for grade 10  
prerequisite: minimum of B- in Accelerated Geometry; departmental approval required

This accelerated level course moves at a brisk pace while covering a robust selection of topics from Algebra 2 and Precalculus. The course focuses on algebraic manipulation of expressions, equations, and inequalities. Students will make deep connections between functions and their graphs as well as explore graphs of non-functions not encountered in previous courses. Rich problem solving and proof writing opportunities are integrated into each unit, providing students with a solid base to enter the two-year Differential and Integral Calculus sequence. Students are encouraged to engage with each other to develop understanding through classroom discourse and to persevere through complex, abstract topics.

## **MTH610 Functions and Trigonometry**

can fulfill the required major for grades 11 or 12 | prerequisite: Algebra II

Functions and Trigonometry can be an alternative to Precalculus. This course expands on topics from Algebra II and focuses on enhancing students' skills in problem-solving. Topics include exponential and logarithmic functions, polynomial and rational functions, trigonometric functions, and probability, sequences, and series. This course is for students who have completed Algebra II and wish to strengthen and broaden their mathematical background before taking Statistics.

## **MTH620 Precalculus**

can fulfill the required major for grades 11 or 12 | prerequisite: Algebra II

This course begins with a semester-long examination of Trigonometry, which applies topics covered in Geometry and Algebra II to triangles and the unit circle. Topics are introduced using a historical perspective and brought to life through a selection of labs. During the second semester, students will take an in-depth look at algebraic concepts, specifically graphing and transforming different types of functions. These skills help prepare students for further mathematical studies. Students planning on taking Calculus must take Precalculus.

## **MTH630 Differential Calculus: Advanced**

can fulfill the required major for grade 11  
prerequisite: minimum grade of B- in Analysis of Functions; departmental approval required

Differential Calculus delves deeply into the topics of limits, derivatives, and derivative applications. It covers material that is typically found in the first course of college calculus. In addition to the foundational skills of calculus, the course covers selected advanced precalculus topics. Students in Differential Calculus can expect to explore and discover differentiation rules and their underlying reasoning through labs, proofs, and technology. This course aims to build strong mathematical thinkers and

communicators and an emphasis is placed on proper notation and the formation of a strong mathematical argument. Students who take this course are expected to complete the calculus sequence by taking Integral Calculus the following year.

## **MTH720 Calculus: Advanced**

major elective | grades: 11, 12 | prerequisite: Precalculus or Analysis of Functions; departmental approval required

Calculus begins with a review of essential material from previous courses which leads to the central calculus concept of a limit, the underlying foundation of the derivative, and the integral. In addition to exploring these big ideas, we take a detailed look at the procedures involved in differentiating and integrating a variety of functions and then explore applications of these calculus techniques. This course covers the skills and concepts of a first-year college-level course.

## **MTH730 Integral Calculus and Series: Advanced**

major elective | grade: 12 | prerequisite: minimum grade of B- in Differential Calculus; departmental approval required

Integral Calculus is a thorough investigation of the integral and its role in the study of calculus. This is the second year of our accelerated two-year study of calculus. It covers material that is typically found in the second course of college calculus. The integral is built upon of the ideas of limits, summation, and the infinite; that is where the course starts. The main content consists of techniques of integration, applications of the integral, and infinite series. The work is rich, algebraically intense, and detailed. Students are guided to craft solid and clear mathematical arguments, and they will see many previously learned techniques surface throughout this work.

## **MTH710 Applications in Statistics: Advanced**

major elective | grade: 12 | prerequisite:  
Algebra II or Analysis of Functions;  
departmental approval required for grade 11  
students

If mathematics is the language that describes the natural world, statistics is the language of society. This year-long, project-based course emphasizes statistical literacy through exposure to the foundational concepts of statistics while also exploring the relevance and role of modern day statistics. Topics included are displaying data numerically and visually in one and two quantitative variables, designing experiments and surveys, understanding basic probability, and introductory statistical inference. The main goal of the course will be to use these tools and techniques to represent and interpret data in meaningful ways while also developing the tools to critically evaluate verbal and written claims made from data by individuals and organizations in our society. In addition, students will be required to read at least one nonfiction work reflecting current scholarship in statistics.

## **MTH810 Accelerated Statistics: Advanced**

major elective | grades: 11, 12 | prerequisite:  
Algebra II or Analysis of Functions;  
departmental approval required

This accelerated course begins with the same foundational topics and goals of Applications in Statistics. However, students in this class move through these concepts at a quicker pace, exploring more challenging problems and examples with a stronger emphasis on the formal mathematical derivations of procedures as they are developed. Students will cover the full range of inference procedures from a first-semester college statistics course, including one and two means and proportions, slope, and chi-square. It will then move on to more advanced topics, including curve straightening, statistical programming, multiple regression, and nonparametric tests.

## **MTH830 Topics in Advanced Mathematics**

major elective | grade: 12 | prerequisite:  
Integral Calculus; departmental approval  
required

Study in advanced mathematics is available to students who have completed our typical course offerings. Based on the number of qualified students, as well as their interests and background, course offerings and course formats may vary. Previous offerings have included Multivariable Calculus and Linear Algebra. Students have studied advanced topics in mathematics in courses offered by GFS faculty, the Global Online Academy, or another online course. Interested students should consult with the department head about available course offerings.

## MODERN LANGUAGES

The goals of the Modern Language department are to equip students with the lifelong tool of a new language, to awaken in them a sustained curiosity and openness to new people, places and cultures, and to have fun in the process. Authenticity and multi-dimensional exposure to new languages are crucial elements in our students' success. In the classroom, we endeavor to bring new languages and new cultures to life through literature, film, music, art, visiting native speakers, and a wide range of computer-assisted, interactive activities. We make every effort to conduct the learning experience exclusively in the target language, and we routinely facilitate individual and group travel to the French and Spanish speaking world beyond our borders. The classroom immersion experience enables students to listen, speak, read and write in the target language.

**Graduation Requirement Note:** Students must complete a Level III modern or classical language to graduate. A second language, not fulfilling the graduation requirement, must be completed through Level II before it may be dropped.

**Additional Note:** Grade levels listed for courses are typical. Students wishing to take a course out-of-grade should see the Head of the Modern Language Department.

### MOD310 French I

major elective | grades: 9, 10, 11

This course gives a foundation in oral comprehension, speaking, reading and writing. The immersion setting allows for the opportunity to master the target language skills in a more authentic environment. Students will hear native speakers and be expected to memorize the material while reproducing the sounds and structure of natural speech. Assessments include written and oral comprehension of selected thematic units presented within a cultural context.

### MOD320 French II

major elective | grades: 9, 10, 11, 12  
prerequisite: completion of the two-year course in Middle School (French Ia and Ib) or French I

Basic grammatical structures and thematic vocabulary are acquired through the use of *Bien Dit!*, the second textbook in a series. Students engage in spontaneous conversations and develop more extensive reading and writing skills by working with appropriate supplementary material. A dynamic classroom environment provides ample opportunity to practice new language skills. Several creative projects require internet exploration on French-language sites, including a dedicated unit on Francophonie and Sénégal. Students also read a short novel

*Le Nouvel Houdini*, designed to improve all language skills.

### MOD410 French III

major elective | grades: 10, 11, 12  
prerequisite: French II

The French textbook series is completed, giving students a thorough grounding in grammar and vocabulary. Supplemental readings include poetry and a guided reader, culminating the year with the study of the beloved classic *Le Petit Prince*. Students develop conversation and discussion skills based on these readings and other authentic materials, including realia, movies, dialogues, and multimedia documents. Free compositions, both analytical and creative, are assigned on given themes. Students are expected to begin to converse more readily on spontaneously generated subjects.

### MOD510 French IV: Advanced

major elective | grades: 11, 12  
prerequisite: French III

This advanced level class will introduce the basics of literary analysis through the study of many genres: poetry, short story, novel, film, Internet articles and comic book. Selected authors will represent the Francophone world with a concentration in the 19th, 20th and 21st centuries. Authors include Maupassant, Sartre, Goscinnny, Ben Jelloun, and a special unit of

Québécois authors. Students will develop finer writing and speaking skills through guided discussions and directed grammatical study, and are expected to participate in daily extemporaneous activities that require an increased mastery of the language. Assessments include oral presentations, quizzes and tests, essays, oral presentations, and collaborative group projects.

### **MOD610 French V: Advanced**

**major elective | grades: 11, 12**  
**prerequisite: French IV**

The emphasis of this course is to further increase both the students' expressive language skills and their analytical abilities. Finer points of grammar and stylistics are reviewed through the use of *Une fois pour toutes*. Year-long themes are examined through the study of Francophone literature, art, cinema, news and magazine articles, and Internet sites. Literary works include *Candide*, *Les Précieuses Ridicules*, a contemporary novel, and selected French short stories, poetry and movies. Formal writing assignments, oral presentations and extemporaneous interactive discussions are required. Additional projects may include writing and filming a short screenplay.

### **MOD810 Mandarin I**

**major elective | grades: 9, 10, 11, 12**

Students are introduced to the speaking and writing of Mandarin within a thematic context. Vocabulary is introduced in authentic encounters, including greetings, family and school life, shopping, transportation, and hobbies. In addition to a textbook and workbook, students will be given a solid foundation of reading, writing, listening, and speaking. Assessments of student learning will be based on oral and written mastery, with an emphasis on spontaneous production.

### **MOD820 Mandarin II and III**

**major elective | grades: 9, 10, 11, 12**  
**prerequisite: Mandarin I or II (placement determined by placement test and teacher)**

Students will work towards the mastery of speaking and writing Mandarin. Within authentic contexts, students will work on further developing their vocabulary as well as their ability to converse fluently. Readings of increasing complexity will help students to develop their skills. Throughout, a solid foundation will be given in reading, writing, speaking and hearing Mandarin. In this beginner-intermediate level course, students begin to do oral presentations on interesting topics. Assessments will be based on oral and written mastery, with an emphasis on spontaneous production.

### **MOD830 Mandarin IV and V: Advanced**

**major elective | grades 9, 10, 11, 12**  
**prerequisite: Mandarin III or IV (placement determined by placement test and teacher)**

Students will systematically work towards mastery of the speaking and writing of Mandarin. In these years students will solidify their sense of grammar and expand considerably the complexity and scope of their conversational fluency. Authentic readings in an array of genres will help students to develop their skills and cultural awareness and understanding. Students will be asked to do presentations and give oral reports. Assessments will be based on oral and written mastery, with an emphasis on spontaneous production.

## **MOD720 Spanish II**

**major elective | grades: 9, 10, 11, 12**  
**prerequisite: completion of the two-year course in Middle School (Ia and Ib) or the yearlong Spanish I course**

This course provides a continuation of the goals of beginning Spanish at a more advanced level. The use of authentic materials, film, articles, short stories and music will enhance cultural awareness while developing reading, writing and oral comprehension skills. Students are expected to speak exclusively in the target language and will begin to develop increased spontaneous speaking skills. The textbook for this course is *Descubre 2* with additional materials provided by the teacher.

## **MOD730 Spanish III**

**major elective | grades: 10, 11, 12**  
**prerequisite: Spanish II**

Students complete a thorough grounding of basic grammatical concepts and increasingly sophisticated vocabulary as presented thematically in the textbook *Descubre 2* and 3. Learning grammar and building vocabulary are increasingly accomplished through unstructured conversation as well as analytical and creative writing. Throughout the course of the year, culture topics are reinforced through videos, internet articles, and current events covering both Spain and Latin America.

## **MOD740 Spanish IV: Advanced**

**major elective | grades: 10, 11, 12**  
**prerequisite: Spanish III**

This course is designed to improve students' mastery of grammar, reading comprehension, and oral fluency through short readings, discussion, dramatizations, as well as creative and analytical writing. The curriculum will include units involving literature, history, film, and art, through topics such as identity, war and propaganda, and folklore. Readings will include short stories, Spanish theater, a Latin American novel, poetry, essays, and periodical literature. Authors may include Jorge Luis Borges, Julio Cortázar, Emilia Pardo Bazán, Federico García Lorca, Julia Alvarez, Ana María Matute, and Carlos Fuentes. Students will develop finer writing and speaking

skills through guided discussions and directed grammatical study. Assessments will include: tests, quizzes, oral presentations, essays, and collaborative group projects.

## **MOD750 Spanish V: Advanced**

**major elective | grades: 11, 12**  
**prerequisite: Spanish IV**

This advanced level course will focus on increasing both students' language skills and their analytical abilities through the study of a novel, short stories, poetry, art, film, and online resources. Students will further explore the people, places, culture, and history of Latin America and its relationship to Spain. Authors may include Gabriel García Márquez, Isabel Allende, Sor Juana Inés de la Cruz, Juan Rulfo, Mario Benedetti, and Antonio Skármeta. Students will explore the Spanish Conquest of Latin America, women's voice in Latin American literature, dictatorships in the Southern Cone, and *Latinidad* in the United States today, while developing finer writing and speaking skills through guided discussions and directed grammatical study. Students are expected to participate in daily activities that require an increased mastery of the language. Assessments will include oral presentations, quizzes and tests, essays, and individual and group projects.

## MUSIC

Rooted in the conviction that students learn most about music by making and experiencing music, the Music Department offers numerous performance and skill-based classes throughout the K-12 curriculum. In the Upper School, students may elect classes in both large and small ensembles; study in these ensembles typically culminates in public performances. Students may also elect to take academic music classes that cover specific historical topics, technical skills, or theoretical and practical understanding.

**Fulfilling the Music Requirement:** 2 semesters taken in grades 9-12 for Class of 2023 and all classes thereafter (Classes prior to the Class of 2023 automatically fulfilled the Music Requirement by taking 9th Grade Music)

**Music Major:** The Music Major is comprised of two or more minor classes taken simultaneously to fulfill a major course requirement. Students may create a Music Major by combining an academic music course (e.g., Music Theory or Advanced Music Composition) with a performance music course (e.g., Orchestra or Choir). The number of course meeting times must be the equivalent of five or more classes. At course sign-up, students in grades 9-12 wishing to create a Music Major select their two or more minors and also select MUS690 Music Major. *Departmental approval required.*

## FALL OFFERINGS

–NEW–

### MUS330 Found Sound

minor elective | grades: 9, 10, 11, 12  
(one semester)

Students will create a choreographed performance that uses everyday items to create percussion, rhythms, and effects (think *Stomp*.) The process involves the discovery of non-traditional sounds and movements to combine and collaborate into a visual and aural masterpiece. Skill sets will involve traditional drumming techniques and rhythms with drumsticks, everyday items, and body percussion. Ordinary objects become the medium for the exploration of timbre, articulation, tone, dynamics, rhythms, and movement. The process of creating individual performance vignettes will be organic, highly participatory and at the discretion of the students. Every student will receive a set of drumsticks to use as part of the course and to build their skills outside of rehearsal time. Students will learn basic rhythmic patterns; more advanced patterns can be explored at the desire and need by students. Participants will need to be willing and ready to move. This course will culminate in a performance.

–NEW–

### MUS340 Music and Cultures

minor elective | grades: 9, 10, 11, 12  
(one semester)

This course explores how styles of music changed throughout history along with other art forms, based on what was happening in the world. Developments in communication, technology, and relationships between nations all played a part with how composers created music. Defining characteristics of four significant periods in music history will be identified, and parallels in styles of literature, visual art, fashion, and dance will be studied. Why did large concert halls become more common starting in the 1800s? What is the fabled tradition that goes along with Handel's famous "Hallelujah" chorus? How did the invention of recording devices change the music industry? These are some questions that will be delved into. This project-based class requires no previous musical training.

–NEW–

### MUS320 Musical Instrument Building

minor elective | grades: 9, 10, 11, 12  
(one semester)

This hands-on class will focus on how musical instruments are made. Students will experiment with sound production by designing and

creating musical instruments from household and recycled materials. We will learn about the science of how instruments work in each of the major instrument families, not only in Western music but also in music from other cultures around the world. We will also compose short pieces for our homemade instruments. Projects may include constructing some of the following instruments: electric kalimba, tin whistle, Cajon, slide trombone, stomp percussion, PVC thongaphone, cigar box guitar, and bamboo pan flute.

**-NEW-**

### **MUS310 Critical Listening in Music**

minor elective | grades: 9, 10, 11, 12  
(one semester)

This class will challenge students to listen more deeply, carefully and thoughtfully through the lens of recorded and live music. While learning about some of the more creative/artistic music genres (classical, ambient/electronic, jazz, and world music to name a few), students will also examine the relationship between listening and mindfulness. We will learn about dissonance in music and art, about the difference between thematic and experiential content, and about some basic music theory ideas and how they pertain to our perception of music. Students can expect a hefty amount of listening and discussion, along with creative writing assignments meant to reflect on, and put to words, our listening skills.

**-NEW-**

### **MUS345 History and Impact of Hip-Hop**

minor elective | grades: 9, 10, 11, 12  
(one semester)

In this course, students will explore the musical and social contributions and conflicts that hip-hop and rap have contributed to both American and global culture over the past half-century. In addition to studying the musical characteristics of both early and contemporary styles, students will discover the historical influences of the genre, including connections to jazz, gospel, and reggae, among others. Students in the course will also compose, create, and record

essential elements found in the genre, using the GarageBand app. The social impact of hip-hop will also be explored, with discussions centered around social justice, cultural appropriation, and other topics highlighted in the lyrics of rap and hip-hop.

## **SPRING OFFERINGS**

**-NEW-**

### **MUS360 Conducting**

minor elective | grades: 9, 10, 11, 12  
(one semester)

Through the development of basic conducting technique, students will develop the relationship between gesture and sound. New conductors will learn to demonstrate musical ideas clearly and efficiently through fundamental conducting gestures. The conducting gesture includes appropriate posture, the use of the baton, expressive and independent use of both hands, beat patterns, cueing, and control of tempo, dynamics, and phrase shaping. We will also study and review musical terminology, instrument transposition, and score reading. Students will need to purchase a baton (of their choice) for use in the class.

**-NEW-**

### **THT830 9th Grade Musical Theatre**

minor elective | grade: 9  
(one semester)

In this course, students will explore the many musical elements that are part of a musical production. The semester will begin with a study of audition etiquette, including slating, as well as proper vocal technique and production. Students will have the choice of auditioning for a lead role or to participate as a member of the ensemble in a full book musical. Once the show has been cast, the course will move to the rehearsal process, including the study of choral, solo, and dance pieces within the production. The exhibition of the course will occur in May and, depending on casting, may require rehearsals outside of the school day. No previous singing experience is necessary. This course is co-taught with the Theatre Department and can fulfill a requirement for that department.

**-NEW-**

## **MUS300 Songwriting**

minor elective | grades: 9, 10, 11, 12  
(one semester)

This class will explore the craft of songwriting by listening and analyzing popular music, examining chord progressions, and studying melodic and chordal relationships. We will look at the role that poetry plays in lyrics, phrasing, and rhyme schemes, and dissect song structure, and social and political themes. Musicians and bands to be studied include the Beatles, Simon & Garfunkel, Joni Mitchell, Nirvana, and Bob Dylan. No instrumental or choral experience needed, but these skills can be utilized in the class. Students will be able to record their songs on GarageBand and score using Sibelius or Noteflight. We will build the art of singing while playing, and potentially pursue keyboarding skills and guitar skills as an accompaniment.

**-NEW-**

## **MUS310 Critical Listening in Music**

minor elective | grades: 9, 10, 11, 12  
(one semester)

This class will challenge students to listen more deeply, carefully and thoughtfully through the lens of recorded and live music. While learning about some of the more creative/artistic music genres (classical, ambient/electronic, jazz, and world music to name a few), students will also examine the relationship between listening and mindfulness. We will learn about dissonance in music and art, about the difference between thematic and experiential content, and about some basic music theory ideas and how they pertain to our perception of music. Students can expect a hefty amount of listening and discussion, along with creative writing assignments meant to reflect on, and put to words, our listening skills.

## **MUS780 Keyboarding**

minor elective | grades: 9, 10, 11, 12

This introductory course is designed to teach students the fundamentals of the piano. Students will learn chord progressions and melodies from popular songs as well as how to read musical

notation on the grand staff (treble and bass clef simultaneously) and in the fake book style (chords and melody on 1 line). We listen to music regularly and write in listening logs about the characteristics that make each piece of music unique. This class will explore improvisation and give students the opportunity to create their own chord progressions and melodies as well as collaborate together to write songs with their peers. By the end of this course, students will be proficient on the piano and be able to use their knowledge to play the chords and melodies to their favorite songs.

## **YEARLONG COURSES**

### **MUS880 Jazz Ensembles**

minor elective | grades: 9, 10, 11, 12  
co-requisite: private instrumental lessons

The jazz ensembles are open to all instrumentalists who wish to explore music from the jazz tradition. Students explore facets of performing as an ensemble, with special attention given to the study of jazz history, important musicians, theory, improvisation and listening to influential recordings. Styles of music other than jazz are sometimes included. Ensembles are arranged with regard to instrumentation, student ability and scheduling. Students in the ensembles are required to take private lessons in order to gain facility and adequate technique. These skills will greatly enhance the proficiency of the individual, and the collective progress of the ensemble. Performance opportunities include GFS assemblies, community events, and the Jazz Night in April.

### **MUS790 Chamber Ensembles**

minor elective | grades: 9, 10, 11, 12  
co-requisite: private instrumental lessons

The Chamber Ensembles are open to all instrumentalists who wish to explore music in small ensembles. Students explore facets of performing as an ensemble, with special attention given to the unique communication and independence of parts within this structure. Repertoire is drawn from a wide range of genres including classical, contemporary, pop, rock, medieval, and instrument-specific styles.

Students who enroll in Chamber Ensembles are placed in duets, trios, quartets or quintets to experience the unique and intimate level of communication that occurs in a small ensemble setting. Ensembles are arranged with reference to instrumentation and students' abilities; all instruments and levels of playing are placed in appropriate groups. Chamber ensembles may include traditional instrumentation (e.g. two violins, viola & cello) or more non-traditional formations (e.g. ukulele or guitar ensemble), depending on the students' interest. Students may also propose their own groups, with the assistance of the orchestra director. Performances include community events, GFS functions, and the Chamber Music Concert in May. Interested musicians should speak with the Orchestra Director for placement.

## **MUS800 Orchestra**

**minor elective | grades: 9, 10, 11, 12**  
**co-requisite: private instrumental lessons**

The Orchestra is open to all instrumentalists (except guitar) who wish to perform within a large ensemble context. (Pianists are often taught percussion technique as well.) The ensemble plays repertoire from a wide variety of genres, including classical, contemporary, Broadway, and pop music; these works are featured in many assemblies, the Holiday Concert and the Orchestra Night concert. In addition to learning challenging repertoire, students focus on orchestral playing techniques that include accurate intonation, dynamic range, sectional blend, and musical phrasing. Students are required to take private lessons on their instrument in order to gain an adequate technical facility.

## **MUS940 World Percussion Ensemble**

**minor elective | grades: 9, 10, 11, 12**

Study in percussion techniques from Africa, the Middle East, Cuba and Brazil is available to any interested student. The course accommodates students of all levels, from beginner to advanced. Students will learn about the process of building a percussion ensemble based on the traditional

instrumental and vocal cues used within the various cultures studied. Techniques and repertoire are presented through rote, traditional notation, graph notation, audio and visual examples, and transcriptions. Instruments used are provided by the instructor, and include Bata drums, Agbadza drums, doumbeks, djembes, and Gyili (African balafons). Students will develop an understanding of and appreciation for the collaborative nature of a percussion ensemble, and gain insight into their own creative forces via this genre.

## **MUS730 Chorus**

**minor elective | grades: 9, 10, 11, 12**

Chorus is a large choral ensemble, and is open to any student who wishes to participate in a singing group. Students in this ensemble work to establish and develop vocal technique, aural skills, and sight-reading abilities. Singers focus on both choral and choral-orchestral works in this ensemble, culminating with concert exhibitions in December and May, among others. This is a non-auditioned ensemble that is open to all students in the Upper School. Although most rehearsals occur during the academic day, occasional after-school and weekend commitments are required.

## **MUS750 Choir**

**minor elective | grades: 10, 11, 12**  
**co-requisite: Chorus**

Choir is an auditioned choral ensemble in the Upper School. Students in this course perform works from many different genres and work to achieve excellence in choral study. Through intensive rehearsal and performances, students develop their vocal abilities, sight-singing skills, and sense of ensemble. Selection is through audition and singers are expected to attend regular rehearsals and performances outside of the academic day, including bi-weekly Sunday rehearsals.

Singers are also required to attend Choir Camp, which will be held from Friday, August 23 to Sunday, August 25, 2019. The ensemble will also be touring in March of 2020. Auditions will take place in May/June 2019.

## **MUS760 Instrumental Improvisation**

minor elective | grades: 9, 10, 11, 12

This course is designed to give students an in-depth, thorough technique of how to improvise on their instrument. The first half of the course will be spent studying the tonal theory behind chordal structures in a variety of musical styles, as well as analyzing transcriptions of notable soloists. This includes jazz terminology, chords, progressions, and soloing guidelines. The second half of the course will involve students actually playing their instruments in class. In doing this, they will gain not only a better concept of the art of spontaneous improvisation, but also learn how to utilize these concepts in their ensembles and musical settings in/out of school. Students who choose this course should have prior training on a musical instrument.

–NEW–

## **MUS520 Cantare**

minor elective | grades: 9, 10, 11, 12  
prerequisite: departmental approval

Cantare is a performing vocal ensemble for treble voices at GFS. Cantare strives to bring voices together in powerful ways. The group explores a wide variety of choral music written for soprano and alto voicing. We have performed classical repertoire from the Medieval era up through the present day, and music from polyphonic singing traditions across the world. Within its repertoire, Cantare will strive to highlight the work of women artists and composers. Performs for daytime assemblies and evening concerts throughout the year.

## **MUS350 Sight Singing & Ear Training**

minor elective | grades: 9, 10, 11, 12

This course develops the skills necessary to read and sing melodies at sight and notate aural material. Classwork includes the study of solfège, rhythm and meter, key signatures, the major, minor and chromatic scales, pitch and interval identification, dictation and error detection, conducting patterns, and the application of sight-reading to musical scores. Basic piano skills will be incorporated into our study as a tool for

understanding pitch relationships. This course develops fundamental aural and sight singing skills, building confidence that will prepare students for more advanced literature and musical performance.

## **MUS710 Music Theory I**

minor elective | grades: 9, 10, 11, 12

Students in this course study the fundamental skills and language of music in order to become increasingly expressive and literate musicians. Course content includes major and minor scales, intervals, key signatures, basic harmonic progressions, and rhythmic figures in simple and compound meters. Aural skills are developed through sight singing with solfege syllables, rhythmic dictation, interval identification, and melodic dictation. Four-part writing and analysis will be studied towards the end of the second semester.

## **MUS720 Music Theory II: Advanced**

minor elective | grades: 10, 11, 12  
prerequisite: Beginning Music Theory or approval by Head of Music Department

This course continues work in four-part writing and analysis through proper voice-leading technique and advanced harmonic progressions. Strong emphasis is placed on the development of aural skills through rhythmic and melodic dictation, as well as intervallic and harmonic identification. Students explore various compositional techniques, culminating in a performance of original works during a spring assembly.

## **MUS610 Music Composition I: Advanced**

minor elective | grades: 11, 12  
prerequisite: Advanced Music Theory or approval by Head of Music Department

This course focuses primarily on 19th-, 20th- and 21st-century Western music, developing the students' understanding of advanced chromatic techniques through both analysis and composition. Material covered includes variation technique, orchestration, form, and model composition. Throughout the year, students

will learn a number of techniques to grapple with different repertoires, such as chromatic-median relationships in early-Romantic music, basic Riemannian functions for late-Romantic harmony, scale networks in Debussy and Faure, ostinato techniques in Stravinsky, post-tonal theory in Bartok and the Second Viennese School, and minimalist techniques in Part, Berio and Reich. Our study of a wide diversity of musical styles will serve as an incentive for student compositions in those styles, and throughout the year, students will compile a portfolio of their original compositional work so they can track their progress. The course will culminate with the performance of an original composition in a style of the student's own choosing during a spring assembly.

## **MUS620 Music Composition II: Advanced**

**major elective | grades: 11, 12**

**prerequisite: Consent of the instructor**

This course is a continuation of Advanced Music Composition I and focuses on 20th- and 21st-century Western music, developing students' understanding of advanced musical techniques through analysis and original composition. Material covered will depend largely on student interest and personal compositional goals, but some possible topics might include choral music, canonic and fugal writing, orchestration, scoring for film, video games, and theatre. Throughout the year, students will learn a number of analytical and compositional models to understand different repertoires, such as scale and modal networks from French music, ostinato techniques from Stravinsky and Glass, octatonic writing from Messiaen, and film scoring from Herrmann and Williams. Our study of a wide diversity of musical styles will serve as an incentive for student compositions in those styles, and throughout the year, students will compile a portfolio of their original compositional work so that they can track their progress. The course will culminate with the performance of an original composition during a spring assembly.

## **MUS770 Masterworks in Music**

**minor elective | grades: 9, 10, 11, 12**

This course is designed to familiarize students with Masterworks in Music from the Western tradition (Renaissance to the present day). Music in this course will be drawn from a variety of genres, styles and musical traditions, which may include: Bach's *St. Matthew's Passion*, Beethoven's *Symphony no. 9*, Brahms's *German Requiem*, Stravinsky's *Firebird*, Bernstein's *West Side Story*, Bob Dylan's *Highway 61 Revisited*, Stevie Wonder's *Innervisions*, etc. In this course, students will come to understand and learn how to describe the stylistic, expressive and structural aspects of selected musical compositions, as well as communicate their experiences with these works. The course will focus on whole musical works, presented chronologically, which will be examined in detail and depth. The principal text of this course, therefore, will not be a book, but rather recordings of musical compositions. An exploration of the works represented on these recordings will be the basis for the discussions and assignments undertaken in this course. Additional readings will be assigned to inform class discussions, many taken from historical source texts written at the time of each composition. This course does not require a reading knowledge of music, but students will gain a rudimentary understanding of musical terminology; the development of students' close listening skills is its central objective.

## **MUS910 Digital Music Recording and Production**

**minor elective | grades: 9, 10, 11, 12**

This course is about the future of music. This is a digital age, and the absolute transformation of everything we thought music to be, is well under way. This course is designed to inspire students to create new music, and to push the boundaries of what music is, has been, and can be in their lives. We will first survey the history of sound synthesis, the art of noise, and the role electronic technology has played in sonic culture throughout the past 120 years. We will timeline the progression from analog to digital recording, synthesizers, MIDI, beat-making, and finally

today's 'in the box' software based computer music. After providing a thorough background on electronic music, we will work primarily with Ableton Live; a software already installed on every computer in the M-306.

The class will cover the basic functionality of both hardware and software mixing consoles. We will discuss the dichotomy between 'button-pushers' and 'real musicians,' and how artists bring soul and true musicality to computer music.

## PHYSICAL EDUCATION

Physical Education in the Upper School is focused on fostering a culture of wellness through regular, meaningful physical activity for all members of our community. Our emphasis is on leading students to develop movement skills and to discover individual interests through their participation in class. Upon completion of a semester-long foundational course in the freshman year, students take on increased responsibility for choosing a PE activity plan that best meets their interests.

## REQUIREMENTS

- 9th grade: One semester PE 9 Foundations; two seasons Athletics
- 10th grade: Three seasons: one season of Athletics; choice of PE or Athletics for other two seasons
- 11th grade: Three seasons, choice of PE or Athletics
- 12th grade: Two seasons, choice of PE or Athletics

**Request for Alternate Physical Education Credit:** Tenth through twelfth graders who pursue an activity outside of the GFS Athletics program that is equal to being on a GFS Athletics team may request “Alternate Physical Education Credit” for their participation. Requests should be made [online](#) (see PE page within Upper School Curriculum section of website). In general, alternate credit is only given for activities which are not offered as part of the GFS PE/Athletics program. Students who are approved for alternate credit must complete assignments through Google Classroom to document their progress and train a minimum of six hours a week.

## GRADE 9

### PE300 PE 9 Foundations

required minor | grade: 9  
(one semester course)

This interdisciplinary class provides a foundation for lifetime fitness and wellness and includes a thorough introduction to the use of our Fitness Center. The understanding and management of one’s own fitness and health are at the core of the curriculum. Topics include nutrition, proper strength-training techniques and the components of fitness.

## GRADES 10, 11, 12

The Physical Education Department provides a rich menu of options in terms of developing personal fitness and exploring fitness options. Students may choose to participate in physical education classes while they are playing a GFS sport but are not required to do so. Physical Education courses are offered by sport season: fall, winter, and spring.

Course offerings are organized as follows:

- **GFS Fitness Club:** Personal fitness activities that meet during or after school (see course descriptions for full information). Fitness Club is two workouts weekly.
- **PE Electives:** These courses generally occur during the school day and may vary by season. Courses meet for two or three single periods per 8-day cycle, or two extended periods per 8-day cycle to facilitate travel off-campus.

# OFFERINGS BY SEASON

## ALL SEASONS

### **PE610 GFS Fitness Club— After School**

minor elective | grades: 10, 11, 12

Join the GFS Fitness Club and customize your personal fitness plan. This program consists of movement activities and classes that will generally occur after school. Students commit to a minimum of 2 workout periods per week, choosing the days and times that are most convenient.

### **PE670 Personal Fitness**

minor elective | grades: 10, 11, 12

Need to finish your school day by 3:20? This Personal Fitness course consists of workout sessions that will occur during the school day. It will meet 3 times per 8-day cycle to allow two workouts per week. No after school workouts are required. All skill levels welcome as you develop an individualized plan that works for you.

### **PE601 Vinyasa Yoga**

minor elective | grades: 10, 11, 12

This all-levels vinyasa (flow) yoga class offers poses designed to stretch and strengthen your body using your own breath as your guide, so that you can find the balance that is most appropriate for you! A strong emphasis is placed on proper alignment, which helps you to stay centered and present while avoiding injury. Poses, especially more challenging ones are taught slowly and thoughtfully, so that you can experience each shape according to your own range of motion. This class offers a nice opportunity to release physical and mental stress, while cultivating inner peace and relaxation - no experience necessary! Class meets after school once a week. Students must be available each Thursday from 3:30-4:30 p.m. to take this class.

## FALL

### **PE710 Archery**

minor elective | grades: 10, 11, 12

Experience the Zen of this target shooting sport. All skill levels welcome.

### **PE720 Golf**

minor elective | grades: 10, 11, 12

Learn the basics of golf and head out to the links. All skill levels welcome.

### **PE700 Badminton/Net Games**

minor elective | grades: 10, 11, 12

Back by popular demand! Take your game to a new level. Hone your skills and play, play, play. We will begin with badminton and may include other net games, e.g. volleyball or pickle ball based on student interest. All skill levels welcome.

### **THT800 Movement for Theatre**

minor elective | grades: 10, 11, 12

This course trains the actor in methods and techniques for opening and conditioning the physical body, one of the actor's primary instruments for artistic expression. Students increase awareness, range, and freedom of movement while exploring the fundamental importance of space, weight, and time as theatrical principles. The course assumes a collaborative approach to theater-making in the study of ensemble-based techniques. Students can also expect to focus on flexibility, strength-training, breathwork, coordination and balance, creative, and improvisational movement. This is not a performance-based class and no prior experience is needed. This course can be taken for PE or Theatre credit.

## OFFERINGS BY SEASON

### WINTER

#### **PE730 Table Tennis/ Urban Adventures**

minor elective | grades: 10, 11, 12

Individualized instruction and visits to the local table tennis club to play. Explore other recreational opportunities based on student interest. All skill levels welcome.

#### **PE740 Fencing**

minor elective | grades: 10, 11, 12

Learn the basics of foil fencing through games and footwork training. Once you acquire a solid grounding in movement skills, correct hitting and tactical distance concepts, we may progress to the introduction of steel weapons and blade work. All skill levels welcome.

#### **PE750 Winter in the Wissahickon/ Urban Adventures**

minor elective | grades: 10, 11, 12

Majestic at any time of year, the Wissahickon beckons hikers, birders and outdoor enthusiasts in the winter months. Explore it, and other urban recreational opportunities in this class. All skill levels welcome.

### SPRING

#### **PE760 Ultimate Frisbee/ Disc Golf**

minor elective | grades: 10, 11, 12

Get outside and play! Get comfortable learning to throw and catch the disc playing Ultimate Frisbee. Then try your hand at Disc Golf. We will travel to the Disc Golf course in Fairmount Park to play after learning how to throw disc “drivers’ and “putters.” All skill levels welcome.

#### **PE780 Wissahickon Hiking**

minor elective | grades: 10, 11, 12

Take to the hills, rocks and valley. Observe the re-awakening of the forest. Venture onto a variety of trails, and savor the spring. Bouldering and rock climbing are possibilities, depending on student interest. All skill levels welcome.

—NEW—

#### **THT810 Modern Dance**

minor elective | grades: 10, 11, 12

This course is an all-levels modern dance class that includes explorations in technique, improvisation, and choreography. Students will engage methods and language common to a variety of modern dance styles and concepts. Most material will be learned through physical participation as students deepen their awareness of the body and explore the connection between the physical, cognitive, and emotional aspects of themselves. Should they choose, students will have the opportunity to perform as part of the annual Poley Festival of student-created work. Course material will be leveled based on the experience of those registered, therefore, previous dance experience is welcome, but not necessary. This course can be taken for PE or Theatre credit.

## SCIENCE

The study of science provides students with powerful ways to understand the natural world. We seek to inspire students' curiosity, develop critical thinking and analytical skills, and provide a foundation for further exploration. Our curriculum emphasizes laboratory work, data analysis, problem solving and clear communication. All Science courses are lab-based and meet for the equivalent of five periods each cycle. Students must satisfactorily complete one course in physical science and one course in biological science. Typically, students take Physics in 9th grade, Chemistry in 10th grade and Biology in 11th grade. Advanced Physics, Advanced Chemistry, Advanced Biology, Environmental Science are available to students who complete introductory coursework.

**Graduation Requirement Note:** All students must take three years of major coursework in science. All students are required to take one year of a physical science and one year of Biology.

### **SCI310 Physics (Physical)**

major elective | grades: 9, 10

This introductory physics course primarily focuses on concepts and laws of classical physics, especially mechanics, including the topics of motion in one and two dimensions, Newton's Laws of Motion, work, energy, power, circular and rotational motion, and the relevant laws of conservation. Material is also drawn selectively from wave motion, sound, light and color.

The emphasis in this course is on conceptual comprehension of this material, but there will be quantitative work that complements the information being studied. Frequent laboratory experiments and reading material will reinforce problem-solving skills. Participation in the Physics Olympics is required.

### **SCI720 Chemistry (Physical)**

major elective | grades 10, 11

This introductory course covers basic chemical vocabulary, nomenclature, stoichiometry, thermochemistry, gas laws, atomic theory, molecular geometry, equilibrium and acid-base chemistry, and provides a solid foundation for more advanced work in chemistry and biochemistry. Weekly labs are included.

Participation in Science Night is required. We strongly recommend that students take chemistry before taking biology.

### **SCI710 Biology (Biological)**

required major | grades: 11, 12

This is an introductory biology course. Students study a range of topics in evolutionary biology, cell biology, systems biology, and molecular

biology. Specific units include evolution and biodiversity, ecology, cellular structure and function, cell cycle, biochemistry, DNA and genetics, protein synthesis, cell respiration, photosynthesis, and systems biology. Labs and several projects give students hands-on experience with biological materials and concepts. It is strongly recommended that students take chemistry before they take biology. Participation in Science Night is required.

### **SCI730 Advanced Chemistry (Physical)**

major elective | grades: 11, 12

**prerequisite: satisfactory completion of Chemistry; departmental approval required**

This course covers much of the same material encountered in first-year college chemistry programs. Labs will occur on a nearly weekly basis and include experiments using pH, temperature, pressure, and other Vernier probes that employ computer-based data acquisition and analysis methodology. Topics covered include: the structure of matter; solution stoichiometry; the kinetic theory of gases and gas laws; thermodynamics; quantum theory and periodicity; chemical bonding and molecular orbital theory; the chemistry of solids, liquids, and solutions; kinetics and equilibria; acids, bases and aqueous equilibria; spontaneity, entropy and free energy; oxidation-reduction reactions and electrochemistry; nuclear chemistry; and a brief overview of organic chemistry. Students will develop an understanding of the fundamentals of chemistry and competence in dealing with chemical problems.

**-NEW-**

## **SCI750 Advanced Biology (Biological)**

major elective | grade: 12

prerequisite: satisfactory completion of chemistry and biology; departmental approval required

This course focuses on a variety of topics including, but not limited to, the origin of life, cancer biology, population genetics, gene regulation, genetic engineering, evolutionary theory, and phylogenetics. Laboratory activities are a part of each unit. During the spring semester, students will learn how to apply molecular data to analyze evolutionary patterns, and they will work collaboratively to build a data set that can be used to answer a specific evolutionary question. Participation in Science Night is required.

## **SCI770 Advanced Physics (Physical)**

major elective | grade: 12

prerequisite: concurrent enrollment in or completion of calculus or integral calculus departmental approval required

This is a fast-paced course that will focus on a variety of topics, including mechanics, special relativity, electrostatics, circuits, magnetism, and more. It builds on material from the introductory physics course, but the introductory course is not a prerequisite. This course is math-intensive and we will use calculus and trigonometry as tools to understand the physics. Computers will be used for simulation, data analysis and the completion of labs. Experiment design will be an important aspect of the laboratory experience. Participation in Science Night is required.

## **SCI740 Environmental Science**

major elective | grades: 11, 12

prerequisite: chemistry

This course will look at a wide range of topics in five major themes: ecology, human population, renewable and nonrenewable resources, environmental quality and pollution, and society and environmental decision-making. Concepts in each theme will be explored by considering global and local environmental issues. We will

also use local resources, such as the Wissahickon Creek, and the Schuylkill and Delaware Rivers. This course is designed for students who would like to pursue a science course that is not a second-year course in chemistry, biology or physics. The coursework will make use of laboratory experiments that can be conducted in the laboratory and in the field. Participation in Science Night is required.

**-NEW-**

## **SCI800 Human Anatomy & Physiology**

Minor elective | grades: 10,11,12

Students will study basic principles of human form and function at the system level, including topics such as integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic/immune, respiratory, digestive, urinary, and reproductive systems. Laboratory activities will be included as part of each unit. In addition, students will engage in independent research.

## **THEATRE**

Our Theatre Arts program provides a range of opportunities that allow every talent to find a place for expression. In addition to an active schedule of annual stage productions, students may elect to pursue coursework in the dramatic arts, movement, technical theatre, and film. Our curriculum offers high-level instruction in the study of acting, dramatic literature, movement techniques, and filmmaking. Classes and productions focus on articulate speech, clarity of utterance, fullness of expression, and storytelling that explores both aesthetics and our common humanity. Through the Theatre Department, students can also learn the arts of technical production, including lighting, sound, and set design.

**Theatre Major:** A theatre major is comprised of two minors taken simultaneously: an academic minor and a performance-based minor. At course sign-up, students in grades 11 and 12 wishing to create a theatre major should select their two minors and also select THT990 Theatre Major. Departmental approval required.

## **ACTING & PERFORMANCE-BASED COURSES**

### **THT710 Acting Fundamentals**

minor elective | grade: 9

Acting Fundamentals is an introductory class exploring theatre as form and acting as craft. We engage in an examination of the history and development of theater over time by reading, discussing, and performing works from some of the most influential plays and playwrights. The majority of our work, however, is focused on the development of each student as a theatrical storyteller. Using contemporary systems and rooted in classic techniques, students are challenged and encouraged to develop the foundational skills of acting for the stage. Students can expect the class to be physical, collaborative, and both skill- and play-based. Student performances occur in-class and all are expected to participate in the spring Poley Festival of student-directed and student-driven theatre. No previous experience necessary.

### **THT720 Acting Methods**

minor elective | grade: 10

This course focuses on the acting and auditioning methods of Stanislavski, Uta Hagen and Shurleff, as well as improvisation. Students

can expect to study acting and directing techniques using outstanding dramatic classical and modern texts. The class explores how different interpretations affect both direction and performance. The spring term study is dedicated to production and performance work for the Poley Festival.

**-NEW-**

### **THT840 Ninth Grade Musical**

minor elective | grade: 9  
(one semester)

In this course, students will explore the many elements that are part of a musical theatre production. The semester will begin with a study of audition etiquette, including slating, as well as proper vocal technique and performance. Students will have the choice of auditioning for a lead role or participating as a member of the ensemble in a full book musical. Once the show has been cast, the course will move to the rehearsal process, including the study of scenework, choral, solo, and dance pieces within the production. The exhibition of the course will occur in May and may require rehearsals outside of the school day. No previous singing or acting experience is necessary. May be taken for Music or Theatre credit.

**-NEW-**

### **THT820 Improv Theatre**

minor elective | grades: 10, 11, 12

In this course you can explore communicating through action and dialogue while not needing to memorize lines. We investigate the humorous *Saturday Night Live* performers who started their careers working on improvisational exercises, writing on their feet, to hone their skills as comedic writers/actors. IMPROV techniques used while working as an ensemble on spontaneity, creativity, wit, physically free playing, and communicative storytelling are explored. The class focuses on growing as an ensemble and meets once a week on Mondays.

**-NEW-**

### **THT830 Musical Theatre**

minor elective | grades: 10, 11, 12  
(one semester)

Acting, singing, dancing: this course is what they call a 'triple threat'. We will study Broadway musicals, both past and present, through the complimentary but distinct lenses of libretto, score, and choreography. Students can expect to learn through participation as we study the vocal, acting, and movement techniques common in this genre of theatre. Coursework may also include dramaturgical studies of particular periods in history as they relate to the performance and writing styles of a given show. The semester will culminate with an in-class showcase of student work and can be taken for either Music or Theatre credit.

### **THT730 Acting & Directing Techniques**

minor elective | grades: 11, 12

What is acting and how is it done? How does someone become someone else? How does the actor free their emotions? How important is believability? Is acting an art or a craft? This course explores these questions and the evolution of actor training as we study and investigate the techniques of: Stanislavski, Strasberg, Adler, Meisner, Esper, Hagen and Brecht. The texts studied are chosen from the anthologies of our finest playwrights from the

past to present time. Our classwork culminates in performances in which student written, directed and acting work is presented in the Poley Festival each spring.

## **DANCE & MOVEMENT COURSES**

### **THT800 Movement for Theatre**

minor elective | grades: 10, 11, 12  
(one semester course)

This course trains the actor in methods and techniques for opening and conditioning the physical body, one of the actor's primary instruments for artistic expression. Students increase awareness, range, and freedom of movement while exploring the fundamental importance of space, weight, and time as theatrical principles. The course assumes a collaborative approach to theater-making in the study of ensemble-based techniques. Students can also expect to focus on flexibility, strength-training, breathwork, coordination and balance, creative and improvisational movement. This is not a performance-based class - and no prior experience is needed. This course can be taken for Theatre or PE credit.

**-NEW-**

### **THT810 Modern Dance**

minor elective | grades: 10, 11, 12  
(one semester course)

This course is an all-levels modern dance class that includes explorations in technique, improvisation, and choreography. Students will engage methods and language common to a variety of modern dance styles and concepts. Most material will be learned through physical participation as students deepen their awareness of the body and explore the connection between the physical, cognitive, and emotional aspects of themselves. Should they choose, students will have the opportunity to perform as part of the annual Poley Festival of student-created work. Course material will be leveled based on the experience of those registered, therefore, previous dance experience is welcome, but not necessary. This course can be taken for Theatre or PE credit.

## TECHNICAL THEATRE COURSES

### **THT700 Technical Theatre**

minor elective | grades: 9, 10, 11, 12

In Technical Theater, students have an opportunity to work on all aspects of bringing a show to opening night and running that show once it gets there. Students work on set construction, stage painting, lighting, design, run crew, and all of the other aspects that go into bringing a show to life. Each trimester will focus on the technical needs of the specific production in season. Students are expected to participate as a member of a production team for at least one mainstage show, which will include call times outside of the regular school day.

**–NEW–**

### **THT850 9th Grade Musical: Stage Crew, Stage Management, & Costuming**

minor elective | grade: 9  
(one semester)

In this hands-on course, students will learn the technical aspects of theatrical production by working on a full book musical with other members of their grade year. Students can elect to participate in one of two technical theatre tracks: Stage Crew/Management or Costuming. The semester will begin with basic skill-building and a study of design. Soon after, the course will transition and be entirely focused on the building of sets, costumes, and props for the Ninth Grade Musical. The exhibition of the course will occur in May and may require work calls outside of the school day. No previous experience is necessary.

**–NEW–**

### **THT791 Stage Management & Set Design**

minor elective | grades: 10, 11, 12  
(one semester)

This course gives advanced technical theatre students the opportunity to hone their skills and develop their capacity as Stage Managers and Designers. Students will work from concept to design in the creation of model sets with the possibility for designing a GFS production.

They will also develop their leadership skills in the study of stage management. This portion of the course will focus on the applied skills of creating prompt books, keeping run crew notes and rehearsal reports, among other stage management practices. Student can expect to support GFS theatre productions.

## ACADEMIC COURSES

### **THT680 Reader's Theatre**

minor elective | grades: 11, 12

This survey course is designed for juniors and seniors who are interested in reading plays within a theatrical historical context. There will be introductory lectures on the evolving styles and the influence that these playwrights had on one another. The course curriculum includes the following playwrights and works: Seamus Heaney's adaptation of Euripides, Commedia Lazzis, Kabuki, Kyogen and Noh plays, Marlowe, Shakespeare, Moliere, Congreve, Dickens adapted by Edgar, Ibsen, Chekhov translated by Frayn, Shaw, Strindberg, Wedekind, Brecht, Pirandello, O'Neill, Wilde, Ionesco, Beckett, Pinter, Williams, Miller, Hellman, Shaffer, Fugard, Albee, Stoppard, Wilson, Shepard, Kushner, Suzan-Lori-Parks, Mamet, Friel, and Hwang.

### **THT940 Shakespeare Studio**

major elective | grades: 11, 12

The influence of Shakespeare's plays on our language and culture is evident and alive in daily conversation and across artistic genres—cinema, theater, opera, and pop culture. This course welcomes actors and non-actors alike: we seek a dynamic and diverse range of backgrounds and experiences. Centered around four Shakespearean plays, the course gives students the opportunity to delve in and get to know these plays well. In Shakespeare Studio we will work around the table and get up on our feet. We will study as actors, directors and dramaturgs in the staging of various scenes from all three plays. Students will begin the course with a Shakespeare Toolkit to introduce them to the world of text work, rhetoric, scansion and dramaturgical study. Students in the tenth grade

may register for this course with departmental approval. Professional theatre artists will workshop various techniques and approaches to the plays of William Shakespeare. We will attend professional productions in the region and screen cinematic interpretations, considering varying directorial viewpoints.

## FILMMAKING COURSES

### **THT750 Introduction to Filmmaking**

minor elective | grades: 10, 11, 12

This entry-level course provides students with a foundation in cinema studies and filmmaking. Students begin the course by examining the history and technology of film while discovering their cinematic voices through micro-films and exercises shot and edited with their smartphones. Students will gain an appreciation of the technical, theatrical, and narrative elements of cinema through assignments that introduce concepts related to cinematography, production design, genres, and editing. Once essential terminologies are defined and students have a greater appreciation for the production process professional filmmaking equipment is introduced to the mix as students are trained to use and maintain the necessary hardware and software to create films. By the end of this course, students will have a firm grasp of pre and post production filmmaking techniques. They will also have a portfolio of films that demonstrate their burgeoning skills and unique point of view as a storyteller. The course will also include assignments related to film criticism and screenings to create dynamic cinephiles out of every student.

**-NEW-**

### **THT751 Film Editing & Post-Production**

minor elective | grades: 11, 12  
(one semester) | prerequisite: Intro to Filmmaking

In this intermediate course, students learn the incredible creative power that post-production provides the filmmaker. Topics of study will include picture editing, sound

editing and mixing, visual effects (VFX), and colour correction. Emphasis is on the overall post-production process and editing, and the importance of knowing the post-production direction well before filming takes place. Hands-on learning with non-linear editing software will introduce students to creating a project and properly organizing and naming files for the purposes of editing. Students will also wrestle with the philosophy and craft of editing to imbue their projects with more substance and meaning.

**-NEW-**

### **THT792 Light, Sound, and Production Design**

minor elective | grades: 11, 12  
(one semester) | prerequisite: Intro to Filmmaking

This hands-on semester course is intended for students interested in building upon their filmmaking skills and diving deeper into aspects of production design with a particular focus on lighting and sound. For the lighting portion of the class, students will learn more about the various types of grips (the camera and lighting technicians involved in filming) while gaining practice in lighting a set in different ways to gain realistic or stylized results. Students will also develop an understanding of “how” sound works through the practical use of microphones and digital platforms like GarageBand, Pro Tools, and Ableton Live. The history of sound design from analog to digital formats will inform this process as students learn about recording original sound effects (Foley) and dubbing audio. Additional topics include lighting and makeup for actors of all hues and sound mixing and sampling.

**-NEW-**

### **THT760 Filmmaking: The Picture is the Thing: Advanced**

minor elective | grades: 11, 12  
prerequisite: Intro to Filmmaking and Film Editing & Post-Production OR Light, Sound, and Production

The goal of this year-long course is to complete one feature-length film by years end. Requirements during the year will consist of a series of short films including one completed

for submission to the Philly Youth Film Festival. Participants will also be required to attend the film festival. Additional assignments will include watching and discussing multiple films with an eye towards approach and execution.

Another goal of the class is for students to decide on the genre of the feature film; narrative, documentary or experimental and complete the film. The final feature length will be between 50 and 90 minutes long. During the course of the year, we will commit to making 2-3 short films and simultaneously complete work on the long-term feature-length film. Focus on technical; lighting, sound, set design etc. as well as a focus on story construction, budgeting, casting etc. will be ingrained into the academic year. From time to time we will have subject area guest lectures visit with the class.

## REQUIRED PROGRAMS

### JANUARY TERM (J-TERM)

January Term enables our community to live the mission and values of our school and explore new passions, interests and interdisciplinary ways of learning about the world. Through a schedule dedicated to course offerings outside of the regular curriculum, January Term provides teachers and students a space for experimentation, investigation and reflection. Students sign up for their January term courses during the fall of each school year.

**Graduation Requirement Note:** Students must complete January Term in grades 9, 10, and 12.

### JUNIOR PROJECTS

The faculty believes that independent study outside the bounds of any particular classroom is an important part of any student's education. The experience of creating a project, organizing it and sustaining it to completion is invaluable in helping students take responsibility for what they learn and how they learn it. By completing their Junior Projects before senior year, students will be able to incorporate the experience of their project into their work in 12th grade. Colleges often ask for assessments of the student's ability to do independent work.

**Graduation Requirement Note:** In 11th grade, every student completes a month-long independent project during the month of January.

**Junior Project Process:** In early May, each member of this year's 10th grade class will be assigned a liaison from the Junior Project Committee. Students should arrange to meet with their liaison twice before the end of the school year. Liaisons help students decide on a project by discussing opportunities that are available to them through members of the school community and programs outside school.

**Junior Project Committee:** This committee, composed of faculty and staff, the 11th Grade Advisors and the Upper School Division Director, oversees the students as they plan and complete their proposals. The committee works hard to give every student the support they need to select a project and complete a successful proposal by December.

### GUIDELINES

- All projects must be student-initiated and student-designed.
- All projects must have definite start and end dates. Students are expected to undertake their projects five days a week for four weeks.
- Proposals must clearly state goals for the project and plans for final presentations, which include both oral and written reports.
- Each student must arrange to have an advisor, who is a member of the GFS faculty, and an on-site supervisor.
- Proposals must be specific, may require a bibliography and always require a letter from the on-site supervisor confirming details of the project.
- Students must report to their GFS advisors once a week during the duration of the project.
- Expensive projects are discouraged. Students are required to earn at least half the money necessary to cover the cost of any project.

## **DIRECTED INDEPENDENT STUDY**

GFS encourages students to take initiative in their own education. Last year, more than 150 students pursued their particular interests beyond the GFS course catalog by developing a Directed Independent Study (DIS) in consultation with a faculty advisor.

A DIS might be composed of one of the following:

- Individual or group study with a GFS teacher on a subject of mutual interest
- Language classes taught by a part-time instructor who comes to GFS
- An online course not already included in the GFS catalog
- A significant weekly project (such as tutoring in a neighborhood school)

### **DIS800 DIS Major**

major elective | grades: 11, 12

Students in the upper grades may elect a program of Directed Independent Study as part of their academic schedule. A DIS major is equivalent to a full-credit course and graded in the same way. DIS majors may not replace a pre-existing course offering without the permission of the department in question. In the past year, students have created DIS majors in Arabic, Buddhism, Philosophy, Creative Writing, and Japanese.

#### **Proposing a DIS Major**

- Interested students first consult with the Director of Independent Study.
- Students must submit a formal proposal to the director by early May, for approval by the Academic Standards Committee.
- Students choosing independent study are required to keep a weekly journal, to write at least one major paper each quarter, and to make periodic informal presentations of their work. In the spring, they are required to make a formal presentation of their work to their advisor and two other faculty members.
- Students should expect to meet regularly with an advisor (a member of the faculty or another adult) and with the Director of Independent Study.

### **DIS Minor**

minor elective | grades: 9, 10, 11, 12

Students may elect a program of Directed Independent Study as part of their academic schedule. A DIS minor should demand the same commitment as the equivalent of a minor elective course. Students may elect to focus on an academic interest or to work on a community outreach project within GFS or in the Germantown community. DIS minors have included philosophy, foreign policy, history of religion, oil painting, creative writing, computer programming and tutoring at GFS or local elementary schools. Students who register online are required to meet with the Director of Independent Study in the fall to confirm the details of their DIS. Those who develop a DIS minor after course sign-up must register for a DIS minor before October 1.

### **DIS Group Minors**

minor elective | grades: 9, 10, 11, 12

Students are expected to develop their own independent study project, but there is an ongoing course Investment that students may join if scheduling permits. Students may register online for these group DIS Minors. For more details, email the Director of Independent Study.

## Opportunities in World Languages

A variety of languages are offered for minor or major credit as part of the Directed Independent Study program that supplement the Modern Language and Classics offerings. Students may elect to take a language DIS in addition to, but not in place of, their foreign language requirement. A language DIS may be taught by an outside tutor or by a GFS teacher. Students wishing to create a DIS Major in a global language should refer to the previous section, *Proposing a DIS Major*.

### **DIS540 American Sign Language**

minor elective | grades: 9, 10, 11, 12

This DIS in American Sign Language and Deaf Culture is a credit/no credit course. Three levels are offered. When signing up, students should indicate their level of study in the notes section of the electronic sign-up form.

### **DIS500 Arabic**

minor elective | grades: 9, 10, 11, 12

This DIS in Arabic language and culture is a credit/no credit course. Three levels are offered. When signing up, students should indicate their level of study in the notes section of the electronic sign-up form.

### **DIS900 German**

minor elective | grades: 9, 10, 11, 12

This DIS in German language and culture is a credit/no credit course. Three levels are offered. Availability strictly limited by teacher's schedule. When signing up, students should indicate their level of study in the notes section of the electronic sign-up form.

### **DIS810 Italian**

minor elective | grades: 9, 10, 11, 12

This DIS in Italian language and culture is a credit/no credit course. Three levels are offered. Availability strictly limited by teacher's schedule. When signing up, students should indicate their level of study in the notes section of the electronic sign-up form.

### **DIS520 Japanese**

minor elective | grades: 9, 10, 11, 12

This DIS in Japanese language and culture is a credit/no credit course. Three levels are offered. When signing up, students should indicate their level of study in the notes section of the electronic sign-up form.

### **DIS970 Russian**

minor elective | grades: 9, 10, 11, 12

This DIS in Russian language and culture is a credit/no credit course. Availability strictly limited by teacher's schedule. When signing up, students should indicate their level of study in the notes section of the electronic sign-up form.

## GLOBAL ONLINE ACADEMY

GFS is a founding member of Global Online Academy, a consortium of outstanding independent schools offering an innovative selection of online courses. Sophomores, juniors, and seniors can supplement their education by taking an online course in a variety of interdisciplinary subjects offered by experienced teachers around the country and abroad.

Students in tenth through twelfth grades may elect, as part of their academic schedule, a semester course in the Global Online Academy (GOA). Students must be responsible in collaborating with their classmates across time zones as they complete class assignments. GOA online courses may be taken as an elective major or as an overload. Students considering registering for a GOA course should consult their grade and/or college counselor. Students enrolled in GOA courses will have weekly check-ins with the Site Director to assist and oversee student progress. GOA registration will take place through the GOA Site director. Sophomores will need to register with approval of Upper School Division Director. Once enrolled in a course, students will receive an email from the Global Online Academy about their course and what the next steps are.

The cost of a one-semester GOA course is \$100 per course. The Business Office will bill parents this amount. Should a student withdraw from a course after the drop date, there will be an additional \$200 fee. The cost of a summer course is \$750.

## KEY DATES

- SEMESTER 1: September 4-December 20, 2019
- SEMESTER 2: January 15-May 1, 2020
- YEARLONG: Both Semesters

## ART, MEDIA, AND DESIGN

### SEMESTER 1

#### **GOA253 Creative Nonfiction Writing**

major elective | grades: 10, 11, 12

Tell your own stories and the stories of the world around you! This course centers on the art of shaping real experiences into powerful narratives while growing foundational writing skills. Participants will read, examine, and write diverse works of creative nonfiction including personal narratives, podcasts, opinion editorials, profile pieces, and more. Emphasizing process over product, this writing workshop provides opportunities to create in new ways. Students will practice essential craft elements (e.g., voice, style, structure) while reflecting on stories from their own lives, communities, and interests. They will also build a personalized library of inspiring mentor texts, consider opportunities for publication, and develop sustainable writing habits. Both in real-time video chats and online

discussion spaces, students will support one another intentionally; feedback is an essential component of this course, and students will gain experience in the workshop model, actively participating in a thriving, global writing community. Creative nonfiction has never been as popular as it is today; participants will experience its relevance in their own lives as they collaboratively explore this dynamic genre.

### SEMESTER 2

#### **GOA292 Advocacy**

major elective | grades: 10, 11, 12

This skills-based course explores the creativity, effort, and diversity of techniques required to change people's minds and motivate them to act. Students learn how to craft persuasive arguments in a variety of formats (e.g., written, oral, and multimedia) by developing a campaign for change around an issue about which they care deeply. We explore a number of relevant case studies and examples as we craft our campaigns. Units include persuasive writing, social media,

public speaking, informational graphics, and more. The culminating project is a multimedia presentation delivered and recorded before a live audience.

## **GOA258 Architecture**

major elective | grades: 10, 11, 12

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

## **GOA272 Computer Science II: Game Design and Development\***

major elective | grades: 10, 11, 12

prerequisites: Computer Science I: Computational Thinking or its equivalent

In this course, students design and develop games through hands-on practice. Comprised of a series of “game jams,” the course asks students

to solve problems and create content, developing the design and technical skills necessary to build their own games. The first month of the course is dedicated to understanding game design through game designer Jesse Schell’s “lenses”: different ways of looking at the same problem and answering questions that provide direction and refinement of a game’s theme and structure. During this time, students also learn how to use Unity, a professional game development tool, and become familiar with the methodologies of constructing a game using such assets as graphics, sounds, and effects, and controlling events and behavior within the game using the C# programming language. Throughout the remainder of the course, students will work in teams to brainstorm and develop new games in response to a theme or challenge. Students will develop their skills in communication, project and time management, and creative problem-solving while focusing on different aspects of asset creation, design, and coding.

*\*Cross-listed in Mathematics and Technology*

## **GOA254 Digital Photography**

major elective | grades: 10, 11, 12

prerequisite: Students must have daily access to a DSLR camera.

In an era where everyone has become a photographer obsessed with documenting most aspects of life, we swim in a sea of images posted on Instagram, Facebook, Snapchat, Pinterest, or another digital medium. To that end, why is learning how to use a digital camera important and what does taking a powerful and persuasive photo with a 35mm digital single lens reflex (DSLR) camera require? Digital photography explores this question in a variety of ways, beginning with the technical aspects of using and taking advantage of a powerful camera then moving to a host of creative questions and opportunities. Technical topics such as aperture, shutter, white balance, and resolution get ample coverage in the first half of the course, yet each is pursued with the goal of enabling students to leverage the possibilities that come with manual image capture. Once confident about technical basics, students apply their skills when pursuing creative questions such as how to understand and use light, how to consider composition, and

how to take compelling portraits. Throughout the course, students tackle projects that enable sharing their local and diverse settings, ideally creating global perspectives through doing so. Additionally, students interact with each other often through critique sessions and collaborative exploration of the work of many noteworthy professional photographers whose images serve to inspire and suggest the diverse ways that photography tells visual stories.

## **GOA250 Fiction Writing**

major elective | grades: 10, 11, 12

This course connects students interested in creative writing (primarily short fiction) and provides a space for supportive and constructive feedback. Students gain experience in the workshop model, learning how to effectively critique and discuss one another's writing in an online environment. In addition to developing skills as readers within a workshop setting, students strive to develop their own writing identities through a variety of exercises. The course capitalizes on the geographic diversity of the students by eliciting stories that shed light on both the commonalities and differences of life experiences in different locations. Additionally, we read and discuss the work of authors from around the globe. Students' essential responsibilities are twofold: to engage in the class as readers and writers and to focus on their development as readers and writers. Both require participation in discussions of various formats within our online community, as well as dedicated time outside of class reading and providing feedback on one another's work and writing original pieces for the workshop.

## **MATHEMATICS AND TECHNOLOGY**

### **SEMESTERS 1 + 2**

## **GOA285 Game Theory**

major elective | grades: 10, 11, 12

Do you play games? Do you ever wonder if you're using the "right" strategy? What makes one strategy better than another? In this course, we

explore a branch of mathematics known as game theory, which answers these questions and many more. Game theory has many applications as we face dilemmas and conflicts every day, most of which we can treat as mathematical games. We consider significant global events from fields like diplomacy, political science, anthropology, philosophy, economics, and popular culture. Specific topics include two-person zero-sum games, two person non-zero-sum games, sequential games, multiplayer games, linear optimization, as well as voting and power theory.

### **SEMESTER 1**

## **GOA298 Number Theory**

major elective | grades: 10, 11, 12

**prerequisite: A strong background in precalculus and above, as well as a desire to do rigorous mathematics and proofs**

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

## SEMESTER 2

### **GOA272 Computer Science II: Game Design and Development\***

major elective | grades: 10, 11, 12  
prerequisite: Computer Science I:  
Computational Thinking or its equivalent

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

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

### **GOA284 Computer Science II: Java**

major elective | grades: 10, 11, 12  
prerequisite: Computer Science I:  
Computational Thinking or its equivalent

This course teaches students how to write programs in the Java programming language. Java is the backbone of many web applications, especially eCommerce and government sites. It is also the foundational code of the Android operating system and many tools of the financial sector. Students learn the major syntactical elements of the Java language through object-oriented design. The emphasis in the course will be on creating intelligent systems through the fundamentals of Computer Science. Students

will write working programs through short lab assignments and more extended projects that incorporate graphics and animation.

### **GOA281 Linear Algebra**

major elective | grades: 10, 11, 12  
prerequisite: Geometry and Algebra 2 or the equivalents

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

## YEARLONG

### **GOA278 Multivariable Calculus**

major elective | grades: 10, 11, 12  
prerequisite: The equivalent of a college year of single-variable calculus, including integration techniques, such as trigonometric substitution, integration by parts, and partial fractions. Completion of the AP Calculus BC curriculum with a score of 4 or 5 on the AP Exam would be considered adequate preparation.

In this course students learn to differentiate and integrate functions of several variables. We extend the Fundamental Theorem of Calculus to multiple dimensions and the course will culminate in Green’s, Stokes’ and Gauss’ Theorems. The course opens with a unit on vectors, which introduces students to this critical component of advanced calculus. We then move on to study partial derivatives, double and triple integrals, and vector calculus in both two and three dimensions. Students are expected to develop fluency with vector and matrix operations. Understanding parametric curve as

a trajectory described by a position vector is an essential concept, and this allows us to break free from one-dimensional calculus and investigate paths, velocities, and other applications of science that exist in three-dimensional space. We study derivatives in multiple dimensions and use the ideas of the gradient and partial derivatives to explore optimization problems with multiple variables as well as consider constrained optimization problems using Lagrangians. After our study of differentials in multiple dimensions, we move to integral calculus. We use line and surface integrals to calculate physical quantities especially relevant to mechanics, electricity and magnetism, such as work and flux. We will employ volume integrals for calculations of mass and moments of inertia and conclude with the major theorems (Green's, Stokes', Gauss') of the course, applying each to some physical applications that commonly appear in calculus-based physics.

## SCIENCE AND HEALTH

### SEMESTERS 1 + 2

#### **GOA267 Bioethics**

major elective | grades: 10, 11, 12

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

#### **GOA265 Global Health**

major elective | grades: 10, 11, 12

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

#### **GOA263 Introduction to Psychology**

major elective | grades: 10, 11, 12

What does it mean to think like a psychologist? In Introduction to Psychology, students explore three central psychological perspectives – the behavioral, the cognitive, and the sociocultural – in order to develop a multi-faceted understanding of what thinking like a psychologist encompasses. The additional question of “How do psychologists put what they know into practice?” informs study of the research methods in psychology, the ethics surrounding them, and the application of those methods to practice. During the first five units of the course, students gather essential information that they apply during a group project on the unique characteristics of adolescent psychology. Students similarly envision a case study on depression, which enables application of understandings from the first five units. The course concludes with a unit on positive psychology, which features current positive psychology research on living mentally healthy lives. Throughout the course,

students collaborate on a variety of activities and assessments, which often enable learning about each other's unique perspectives while building their research and critical thinking skills in service of understanding the complex field of psychology.

### **GOA264 Medical Problem Solving I** major elective | grades: 10, 11, 12

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

### **GOA305 Positive Psychology** major elective | grades: 10, 11, 12

What is a meaningful, happy, and fulfilling life? The focus of psychology has long been the study of human suffering, diagnosis, and pathology, but in recent years, however, positive psychologists have explored what's missing from the mental health equation, taking up research on topics such as love, creativity, humor, and mindfulness. In this course, we will dive into what positive psychology research tells us about the formula for a meaningful life, the ingredients of fulfilling relationships, and changes that occur in the brain when inspired by music, visual art, physical activity, and more. We will also seek out and lean on knowledge from positive psychology research and experts, such as Martin Seligman's Well Being Theory, Mihaly Csikszentmihalyi's idea of flow, and Angela Lee Duckworth's concept of grit. In exploring such theories and concepts, students will imagine and create real-world measurements

using themselves and willing peers and family members as research subjects. As part of the learning studio format of the course, students will also imagine, research, design, and create projects that they will share with a larger community. Throughout the development of these projects, student will collaborate with each other and seek ways to make their work experiential and hands-on. Students will leave the class with not only some answers to the question of what makes life meaningful, happy, and fulfilling, but also the inspiration to continue responding to this question for many years to come.

## **SEMESTER 1**

### **GOA268 Social Psychology** major elective | grades: 10, 11, 12

Are you thinking and acting freely of your own accord or is what you think, feel, and do a result of influences by the people around you? Social psychology is the scientific study of how and why the actual, imagined, or implied presence of others influences our thoughts, feelings, and behavior. The principles of social psychology help explain everything from why we stop at stop signs when there is no one around to why we buy certain products, why in some situations we help others and in some we don't, and what leads to more dramatic (and catastrophic) events such as mass suicides or extreme prejudice and discrimination. As we take up these topics and questions, students will build and engage in a community of inquiry, aimed primarily at learning how to analyze human behavior through the lens of a social psychologist. Social Psychology invites students to explore, plan, investigate, experiment, and apply concepts of prejudice, persuasion, conformity, altruism, and the self that bring the "social" to psychology. The course culminates in a public exhibition of student-designed investigation of a social psychological topic of their choice. This course uses a competency-based learning approach in which students both build GOA core competencies that transcend the discipline and learn how to think like a social psychologist. Much of the course is self-paced; throughout the

semester, students are assessed solely in relation to outcomes tied to the competencies.

## SEMESTER 2

### **GOA266 Abnormal Psychology**

major elective | grades: 10, 11, 12

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

### **GOA269 Medical Problem Solving II**

major elective | grades: 10, 11, 12

prerequisite: Medical Problem Solving I

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

### **GOA290 Neuropsychology**

major elective | grades: 10, 11, 12

Have you ever wondered how your brain determines all aspects of your behavior, emotion, learning and understanding each moment of the day? In Neuropsychology we will tackle this enormous question through our exploration of basic brain anatomy and function and the neurobiological perspective on cognitive and behavioral disorders. In addition, students investigate the neuropsychology of mindfulness, learning and memory along with how the brain and human behavior change over time. Students also pursue a citizen science project on mapping neurons to understand the nature and process of

scientific research. The course culminates with students developing a fundraising campaign for a nonprofit foundation or research organization of their choosing, which supports research and/or patient care initiatives on a specific neurological condition. Student project topics have included everything from Alzheimer's disease to traumatic brain injury, addiction, synesthesia, and other areas of interest. We also focus on diagnostic and treatment challenges, including behavioral and pharmaceutical management. Neuropsychology can be taken as a continuation of Introduction to Psychology, although Intro is not a prerequisite.

## SOCIAL SCIENCES

### SEMESTER 1

### **GOA315 International Relations**

major elective | grades: 10, 11, 12

Are China and the U.S. on a collision course for war? Can the Israelis and Palestinians find a two-state solution in holy land? Will North Korea launch a nuclear weapon? Can India and Pakistan share the subcontinent in peace? These questions dominate global headlines and our daily news feeds. In this course, you will go beyond the soundbites and menacing headlines to explore the context, causes, and consequences of the most pressing global issues of our time. Through case studies, you will explore the dynamics of international relations and the complex interplay of war and peace, conflict and cooperation, and security and human rights. Working with classmates from around the world, you will also identify and model ways to prevent, mediate, and resolve some of the most pressing global conflicts.

### **GOA312 Introduction to Investments**

major elective | grades: 10, 11, 12

In this course, students simulate the work of investors by working with the tools, theories, and decision-making practices that define smart investment. We explore concepts in finance and apply them to investment decisions in three primary contexts: portfolio management,

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

### **GOA316 Introduction to Legal Thinking**

major elective | grades: 10, 11, 12

Inspired by GOA's popular Medical Problem Solving series, this course uses a case-based approach to give students a practical look into the professional lives of lawyers and legal thinking. By studying and debating a series of real legal cases, students will sharpen their ability to think like lawyers who research, write and speak persuasively. The course will focus on problems that lawyers encounter in daily practice, and on the rules of professional conduct case law. In addition to practicing writing legal briefs, advising fictional clients and preparing opening and closing statements for trial, students will approach such questions as the law and equity, the concept of justice, jurisprudence and legal ethics.

### **GOA288 Microeconomics**

major elective | grades: 10, 11, 12

In this course, students learn about how consumers and producers interact to form a market and then how and why the government may intervene in that market. Students deepen their understanding of basic microeconomic

theory through class discussion and debate, problem solving, and written reflection. Students visit a local production site and write a report using the market principles they have learned. Economic ways of thinking about the world will help them better understand their roles as consumers and workers, and someday, as voters and producers.

### **GOA317 Race & Society**

major elective | grades: 10, 11, 12

What is race? Is it something we're born with? Is it an idea that society imposes on us? An identity we perform? A privilege we benefit from? Does our own culture's conception of race mirror those found in other parts of the world? These are just a few of the questions that students in this course will explore together as they approach the concept of race as a social construct that shapes and is shaped by societies and cultures in very real ways. Throughout the course students will learn about the changing relationship between race and society across time and across cultures. Engaging with readings, films, and speakers from a variety of academic fields (history, sociology, anthropology, literature) students will explore, research, reflect on and discuss the complex set of relationships governing race and society.

## **SEMESTER 2**

### **GOA286 9/11 in a Global Context**

major elective | grades: 10, 11, 12

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

## **GOA276 Gender Studies**

major elective | grades: 10, 11, 12

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

## **GOA291 Macroeconomics**

major elective | grades: 10, 11, 12

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

## **GOA308 Prisons and the Criminal Law**

major elective | grades: 10, 11, 12

Criminal courts in the United States have engaged in an extraordinary social experiment over the last 40 years: they have more than quintupled America's use of prisons and jails. Has this experiment with "mass incarceration" produced more negative effects than good? Is it possible at this point to reverse the experiment

without doing even more harm? In this course, students become familiar with the legal rules and institutions that determine who goes to prison and for how long. Along the way, students gain a concrete, practical understanding of legal communication and reasoning while grappling with mass incarceration as a legal, ethical, and practical issue. In an effort to understand our current scheme of criminal punishments and to imagine potential changes in the system, we immerse ourselves in the different forms of rhetoric and persuasion that brought us to this place: we read and analyze the jury arguments, courtroom motions, news op-eds, and other forms of public persuasion that lawyers and judges create in real-world criminal cases. Topics include the history and social functions of prisons; the definition of conduct that society will punish as a crime; the work of prosecutors, defense attorneys, and judges in criminal courts to resolve criminal charges through trials and plea bargains; the sentencing rules that determine what happens to people after a conviction; the alternatives to prison when selecting criminal punishments; and the advocacy strategies of groups hoping to change mass incarceration. The reading focuses on criminal justice in the United States, but the course materials also compare the levels of imprisonment used in justice systems around the world. Assignments will ask students to practice with legal reasoning and communication styles, focused on specialized audiences such as juries, trial judges, appellate judges, sentencing commissions, and legislatures. The work will involve legal research, written legal argumentation, peer collaboration, and oral advocacy.

*Note: This course is offered through Wake Forest University School of Law and is designed by Ronald Wright, the Needham Y. Gulley Professor of Criminal Law. Prof. Wright is also part of the teaching team for this course. Students who take this course should expect a college-level workload (8-10 hours a week). Successful completion of this course will be rewarded with a certificate from the law school.*

# Notes

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