The Course Catalog is subject to change; this version was last edited on 08/10/2019.
## 2019-20 CALENDAR

### Fall Term

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, September 2</td>
<td>Varsity football, field hockey, girls cross country, soccer, and volleyball athletes arrive, by invitation from coaches (11:00 a.m.–1:00 p.m.)</td>
</tr>
<tr>
<td>Tuesday, September 3</td>
<td>Varsity boys cross country athletes arrive, by invitation from coaches (1:00-2:00 p.m.)</td>
</tr>
<tr>
<td>Thursday, September 5</td>
<td>Remaining Sixth Form students arrive (9:00–11:00 a.m.)</td>
</tr>
<tr>
<td>Friday, September 6</td>
<td>New international family orientation, by invitation (11:00 a.m.-2:00 p.m.)</td>
</tr>
<tr>
<td>Saturday, September 7</td>
<td>New students and all Third Formers arrive (9:00–11:00 a.m.)</td>
</tr>
<tr>
<td>Sunday, September 8</td>
<td>Remaining returning students arrive (11:00 a.m.–1:00 p.m.)</td>
</tr>
<tr>
<td>Tuesday, September 10</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Friday, October 11</td>
<td>Fall Long Weekend (11:30 a.m. departure or after Varsity/JV games)</td>
</tr>
<tr>
<td>Monday, October 14</td>
<td>Students return by 9:00 p.m.</td>
</tr>
<tr>
<td>Friday, October 25 – Sunday, October 27</td>
<td>Parents Weekend</td>
</tr>
<tr>
<td>Saturday, November 23</td>
<td>Thanksgiving Vacation (11:30 a.m. departure)</td>
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### Winter Term

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<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Wednesday, December 4</td>
<td>Students return by 9:00 p.m.</td>
</tr>
<tr>
<td>Wednesday, December 18</td>
<td>Christmas Vacation (11:30 a.m. departure)</td>
</tr>
<tr>
<td>Monday, January 6, 2020</td>
<td>Students return by 9:00 p.m.</td>
</tr>
<tr>
<td>Thursday, February 6</td>
<td>Winter Long Weekend (11:30 a.m. departure)</td>
</tr>
<tr>
<td>Monday, February 10</td>
<td>Students return by 9:00 p.m.</td>
</tr>
<tr>
<td>Saturday, March 7</td>
<td>Spring Vacation (11:30 a.m. departure)</td>
</tr>
</tbody>
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### Spring Term

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, March 30</td>
<td>Students return by 9:00 p.m.</td>
</tr>
<tr>
<td>Saturday, April 25</td>
<td>Spring Long Weekend (11:30 a.m. departure or after Varsity/JV games)</td>
</tr>
<tr>
<td>Tuesday, April 28</td>
<td>Students return by 9:00 p.m.</td>
</tr>
<tr>
<td>Sunday, May 31</td>
<td>Prize Day</td>
</tr>
<tr>
<td>Friday, June 5</td>
<td>Summer Vacation</td>
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</tbody>
</table>

*Because we are not prepared in our dormitories or Dining Hall to accept students early, students should return at their scheduled time and not before, both in September and following vacations.*

- Please note that Groton School is closed over winter Long Weekend.
- No vacations or long weekends may be extended on either side.
- When leaving Groton, airline flights should not be scheduled before 2:00 p.m.
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ACADEMIC PHILOSOPHY

"What is the purpose of a Groton education?" Endicott Peabody answered that question by declaring, "To prepare for the active work of life." Early in the school's history, Endicott Peabody stated: "From the first, we rejected the idea of its being regarded as a preparatory school, which implies a scholastic standard simply adequate to the preparation for college...the training of the mind aimed at should be such as was described by the graduate of the French lycée who found himself able to take up successfully any subject owing to his early training."

ACADEMIC PROGRAM

The Groton curriculum is designed to prepare students for "the active work of life" by encouraging breadth of intellectual exposure and depth of study. Beginning in the Second and Third Forms, with programs of study prescribed and continuing on through the Fourth, Fifth, and Sixth Forms, the curriculum as a whole introduces students to a wide variety of courses in the belief that this broad exposure will challenge and engage interests and capabilities that might otherwise lie dormant. The curriculum also fosters the development of critical and disciplined thinking, precise communication and scientific analysis, creative problem-solving, careful and logical thinking, and empathetic understanding of the social, scientific, and political background of Western and non-Western civilization. This curriculum plan has been and continues to be in a constant state of review and evolution. We feel it will enable our students to address the challenges of the twenty-first century with confidence, compassion and sound judgment.

Second and Third Forms (grades eight and nine): The curriculum in the Second and Third Forms challenges students across the intellectual spectrum and encourages students to immerse themselves in the basic disciplines. The definition of "basic disciplines" includes at least two years' study of a classical language, Latin or Greek, in the belief that this exposure will provide an ability to analyze carefully and to synthesize various expressions of thought.

Fourth, Fifth, and Sixth Forms (grades ten, eleven, and twelve): Building on the basic disciplines, the curriculum for Fourth, Fifth, and Sixth Formers offers students the opportunity to study subjects in depth while affording a variety of elective courses to supplement or enhance their courses of study.

Within and beyond the requirements, students choose from a broad spectrum of courses in all disciplines to explore in depth areas of interest. Many students take six courses; the minimum number of courses required in any term is five. Advanced Placement (AP) courses are available in several departments; in others, courses are taught at a level that prepares students for the Advanced Placement examination, such as US History, Fifth Form English, and Calculus. A number of options exist for independent study in the Sixth Form.
I. HONOR CODE (Adopted by vote of the student body, June 2000)

“Groton is a small community in which trust and honesty are of the highest value and in which any form of cheating or dishonesty creates undercurrents of distrust throughout the students and faculty. Groton is an institution of learning and moral development, established with the purposes of intellectual growth and ethical awareness. Dishonesty and cheating impede both, and work against the creation of trust. We, the students of Groton School, feel that each individual must take full responsibility for his or her own integrity. For these reasons, we do not tolerate any lying or cheating, and uphold honor and integrity.

“A major aspect of the Honor Code is a ‘reminder statement’ to be written by all students on their tests, papers, quizzes, and exams. The statement is: On this work I have upheld Groton’s Honor Code. The implication is that the student did not receive improper help, copy from another source, or witness any other student doing this on the assignment. The statement is brief and memorized by every student. Its presence during the academic day serves as a reminder to Groton students of our Honor Code and the integrity we value.”

II. ACADEMIC REQUIREMENTS

Second Formers take the following courses:
- English; math; French, Spanish, or Chinese; Latin; science; and arts

Third Formers take the following courses:
- English; math; French, Spanish, or Chinese;
- Biology or Ecology
- Latin; students may petition the Classics Department if they would like to take Greek instead of Latin;
- Sacred Texts;
- Arts (one-half credit course in shop, music, or studio art).

NOTE: Students who begin a classical and a World Language in Second or Third Form must complete a minimum of two years in each.

Upper School students must take and pass a minimum of five one-credit courses per term, fifteen credits per year; many will take five and one-half, six, or six and one-half. If a student fails a course, that course credit must be made up. In such a case the student must seek the advice of the Academic Dean. Upper School students also will take a one-term course (minimum) in the Religious Studies and Philosophy department.

Fourth Formers take:
- English, math, a language;
- Choices to fill out the five or six credits include World and the West (either Fourth or Fifth Form), a lab science, Comparative Religion (for new Fourth Formers), an art course, a second language, or a second science.

**Fifth Formers** take:
- English, math, a language;
- Choices to fill out the five or six credits include US History or World and the West for those who have not yet taken it, science, Comparative Religion (for new Fifth Formers or those new as Fourth Formers who did not take it), a second language, art, history, or English electives.

**Sixth Formers** take Expository Writing in the fall and are encouraged to take English electives in the other terms. They are also urged to continue with their language and mathematics. All will take a one-term Religious Studies and Philosophy course in the Upper School. Whether they will have any other required courses depends upon the extent to which they have completed their diploma requirements. Many electives may be taken on a term-by-term basis.

**NOTE:** One-half credit courses are taken in addition to five or six one-credit courses. All music courses are half-credit and may be taken on top of five or six full credits, but two together may not replace a full-credit course.

### III. DIPLOMA REQUIREMENTS

In order to be eligible for the Groton School diploma, a student must have completed the following in addition to the form requirements already cited:

- English, through the Fifth Form, plus a term of Sixth Form Expository Writing;
- mathematics, through trigonometry (the first term of Precalculus) or through the Fifth Form year, whichever comes later;
- language, classical or world, through level 3 or through the Fifth Form year, whichever comes later; students taking a second language must complete at least two years of that language;
- World and the West and US History;
- a full year of lab science in the Upper School;
- Comparative Religion (for students who arrive in Fourth or Fifth Form) and one other course in the Religious Studies and Philosophy Department during the Upper School (departmental permission is required to do so in the fall of Fourth Form);
- three credits of arts during the Sixth, Fifth, or Fourth Form years.

A student may petition the Academic Dean for an exemption from one or another of these requirements in order to pursue other areas in greater depth.
IV. COURSE SELECTION AND SCHEDULE

In the spring, students will work with their faculty advisors to plan their courses for the entire next year, taking into account form and diploma requirements. The school year includes three terms: Fall, Winter and Spring. Some courses require a full year commitment, and others are offered on a term basis; changes may be made to term course selection for the Winter and Spring Terms if new electives are offered.

Entering students will select courses using materials provided by the Academic Dean; however, students will be placed in appropriate courses by department heads who interpret the placement materials.

Each student's program of study is subject to the approval of the student's faculty advisor, a member of the Studies Committee, and the Academic Dean.

Students should be aware that if a particular course lacks sufficient enrollment, that course may not be offered. On the other hand, students should also realize that if sufficient interest is expressed for an elective course that is not included in a department’s program, the department will make every effort to make that course available.

Listed in this online brochure are all the courses to be offered this coming fall. Most of the courses likely to be offered in Winter and Spring Terms are also listed. Periodic updates to the catalog will be posted online as well as outside the Registrar’s office, including additional courses for the Winter and Spring Terms.

Important Scheduling Notes:

A. When planning their courses, students should understand that they might have to choose between two courses that meet in the same time block, though time blocks may not be known until the schedule is completed in the summer.

B. **YEAR COURSES:** If a course is designated as a year course, the student must take it for the full year -- **ALL THREE TERMS** -- in order to receive credit. A student who signs up for a year course cannot withdraw from that course unless he or she has the approval of the appropriate department head and of the Academic Dean. Any term grades earned before the course is dropped will be used in calculating averages for honors diplomas. The transcript will show WP (withdrawn passing), WF (withdrawn failing), or WM (withdrawn for medical reasons).

C. The Mathematics/Computer Science and Language Departments will determine which particular section a student will enter.

D. Sectioning is not assigned on the basis of preference for individual teachers. Resectioning will occur later in the year if deemed appropriate by the teacher and department head.
E. Students may drop elective courses in the first week of a new term without penalty. A student carrying six full-credit courses may extend that drop period for the sixth course until the end of the second week of the term without penalty (in the winter and spring, this applies only to term courses, not year courses). On occasion, in the fall, a student will be encouraged or allowed to drop a course at the midterm.

F. No student can enter a course for credit after the first week of a new term.

V. OTHER ACADEMIC ISSUES

A. **Classes:** A full course meets 180-240 minutes a week, with four 45-minute class meetings; in some courses one or two of those meetings is extended by 30 minutes. A half-course usually meets three (2x45 + 1x75 minutes) or four times (4x45 minutes) a week with no expectation of preparation.

Teachers will expect the following amounts of homework preparation time from students:

- **Second and Third Forms:** about 30 minutes for each class meeting;
- **Fourth Form:** about 40 minutes for each class meeting;
- **Fifth Form:** about 50 minutes for each class meeting;
- **Sixth Form:** about 60 minutes for each class meeting.

B. **Conference Period:** Any student who is having difficulty in a course should seek extra help. The best time for this is during Conference Period or at the convenience of the teacher and student.

If any student is having difficulties or problems, teachers should be sure to inform and consult with the student's faculty advisor.

C. **Exams and Protected Period:** All full-credit courses end with two-hour term examinations, papers, or projects in November (the end of Fall Term) and in June (the end of Spring Term). There are no term examinations at the end of Winter Term. Sixth Formers are excused from the June examination unless the course fulfills a diploma requirement.

The final week of Winter Term (late February and March) is specified as Protected Period. During this time students may have only two major commitments (tests, projects, papers, reports, etc.) on each day in order to protect them from being over-extended.

D. **Grade Reports:** Grade reports are posted on myGroton at the end of each of the three terms. They include numerical grades in units of one, narrative comments, and at the end of
the Fall and Spring Terms, a letter from the advisor. It is the practice of the school not to give a term or year grade lower than a 50. Anything below 60 is a failing grade.

Some courses are of such a nature that numerical grading is unrealistic and will be graded on honors (H), pass (P), fail (F) basis. An H-P-F grade is entered on the student’s record, but it is not included in determining the student’s cumulative average.

**E. Course Failures:** Departments differ in their approach to course failures and have different policies regarding make-up work. Options may include preparing for a make-up exam by going to a summer school or by working with a tutor, taking an approved summer course elsewhere to fulfill the work, repeating the course the following year, or taking another course in the department in the future.

A senior who fails a term course in the spring will need to make up the credit before a diploma is awarded, no matter how many extra courses or credits the student may have accumulated.

Students in the Upper School who pass a course but fail the final exam will be handled separately by each department since some departments feel that the year grade is determinative.

**F. Vacation Work:** It is often important for students who have failed exams, especially exams in cumulative courses, or who have shown particular weakness, to do make-up work over the winter, spring, or summer break and perhaps even to take a re-examination at the beginning of the new term. Teachers and departments retain discretion with regard to requiring vacation work and re-examination for students.

The grades that a student receives at the end of a term are not altered if the student does vacation work. The purpose of the vacation work and re-examinations is to put the student in a stronger position to continue a course, especially a cumulative course.

**G. Plagiarism:** Plagiarism occurs when one puts forward or uses as one’s own the ideas, words, data, or work of another person or people without attributing those ideas, words, data, or work to the proper source. If a fact or idea is part of general knowledge (e.g., a molecular weight from the periodic table of elements, a historical date), it is not necessary to give credit to a specific source. Any data, ideas, opinions, or other original expressions of thought, however, that come from a particular source, print or electronic, must be attributed to the original author or source. Plagiarism can occur across the academic disciplines and, in every instance, is regarded as a very serious violation of honesty.

It is very important that students seek their teachers’ help in deciding what information is part of general knowledge and what information must be attributed to its source. Teachers will discuss plagiarism with students, including how to attribute ideas to sources in collaborative efforts. In
every case in which a student has a question, it is the student’s responsibility to seek help from a teacher or other faculty member.

The determination of plagiarism is in the hands of the department in which the case arises, which will also take into consideration any mitigating circumstances. If a problem with plagiarism arises, the teacher, department head, Academic Dean, and Dean of Students will meet with the student and the student’s faculty advisor to discuss concerns. If the department decides to bring a charge of plagiarism, the case will then go to the Dean of Students who will take the case to the Disciplinary Committee, which will recommend a punishment for the case as it has been defined by the department.

Please refer to the Student/Parent Handbook for information on the disciplinary response to cheating.

H. Diplomas with Distinction: The nature of the diploma is determined by the cumulative average that a student earns in his or her Fourth, Fifth, and Sixth Form years at Groton.

Form averages are determined by adding the year and term grades and dividing by the potential number of credits. A half course receives half weight, and an H-P-F grade is not used in determining the average.

A cumulative Upper School average of 86-88 makes a student eligible for a diploma cum laude.

A cumulative Upper School average of 89-91 makes a student eligible for a diploma magna cum laude.

A cumulative Upper School average of 91.5 or higher makes a student eligible for a diploma summa cum laude.

Note: In the case of a course failure or a course withdrawal (where a term grade has been recorded), the grade and potential credits earned in the discipline are included in calculating the form average.

I. Honor and Merit List: The Honor and Merit Lists provide recognition for students in the Second, Third, and Fourth Forms who have achieved at a high level in their courses. There is no Honor or Merit List for the Fifth or Sixth Forms.

In determining eligibility for the Honor or Merit List for the Second and Third Forms, the class-work grade, not the term average, is determinative. For Fourth Formers, the term average is used.

Merit List: To be on the Merit List, a student must have a grade of 80 or better in all courses except two; these two can be between 75 and 79.
**Honor List:** To be on the Honor List, a student must have a grade of 85 or better in all courses except two; these two can be between 80 and 84.

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**VI. SPECIAL PROGRAMS FOR SIXTH FORM**

**A. Tutorial Program:** The tutorial program is designed for Sixth Formers to allow serious students to do advanced study in a particular area not currently available in the school's curriculum. Since students are expected to do considerable independent study, they should not contemplate taking tutorials unless they already have fairly strong backgrounds in the particular fields.

The tutorial program assumes that students will push and extend themselves to a degree not usually invited by regular courses. The quality of scholarship is expected to be high, and the amount of work to be produced is expected to exceed that of a regular course.

Unless there are special circumstances, all tutorials are worth one credit. If a tutorial is taken for half-credit, it is taken in addition to the normal five-credit roster of courses.

Tutorial applications are due at the same time as regular course sign-ups. Each tutorial is subject to the review and approval of the Studies Committee.

**B. Intensives etc.:** Sixth Formers have several options open to them in the Spring Term. They may take a minimum of five full courses or the equivalent, they may design tutorials or courses of their own, they may undertake on-campus or off-campus projects, or they may apply for admission into the Intensive Program. In the Intensive Program, a student takes one regular classroom course (in order to protect those students who are committed to a year course). The rest of his or her academic program is an intensive involvement in one area. The Spring Term is divided into three equal segments, each segment lasting about three weeks. For each segment, the student designs an academic program with a member of the faculty and writes up a contract.

The Intensive Program affords a great deal of freedom and time for the student to pursue an area that is of interest. The emphasis is upon independent study. The student does not attend classes in the traditional sense nor does he or she receive prescriptive assignments in the traditional sense. Since an Intensive is the equivalent of four regular courses, the student's time commitment is
approximately thirty hours per week. Any student who thinks that he or she might be interested in applying for the Intensive Program should be sure to fulfill all diploma requirements before the end of the Winter Term.

Any student who would like to apply for an Intensive Program, an off-campus project, or any variation from the normal academic program should first consult with the Academic Dean. Applications for Intensives are due with course applications for the Spring Term.

VII. ACADEMIC SUPPORT

A student may face individual challenges to learning unrelated to intelligence. These challenges can take the form of problems with approach and organization, learning style differences, or discrete learning disabilities. Early identification of learning challenges and appropriate intervention are important to enhancing the opportunity for success for every student at Groton.

If there is concern about a student’s performance, a referral will be made to the Director of Academic Support. She will meet with the student, assess the situation, and take appropriate action. The School’s resources include assistance with academic time management and introduction to alternative learning styles. Testing for learning differences and disabilities may be recommended. Parents will be contacted and their permission obtained prior to any referral for evaluative testing.

Groton School works with an educational psychologist who consults with students, families, and the school to evaluate and work with students who are interested in improving their academic performance. Students and families should speak to the Director of Academic Support regarding these kinds of services.

There are no separate courses of study for students with disabilities, but within the prescribed curriculum, the Director of Academic Support will work collaboratively on individual accommodations with students who have documented discrete learning differences or abilities.

A. Peer Tutors: Peer tutors, students who have designated themselves as tutors in particular disciplines of strength, are available to younger students in need. The Director of Academic Support will compile a list of such tutors at the beginning of the school year and will help anyone interested in finding an appropriate tutor.

B. Outside Tutors: Because Groton is a residential school and teachers are readily available for extra help outside of the class, the school does not support the use of outside tutors.

VIII. FINAL EXAM GUIDELINES
A. **Integrity, Behavior, and Study Materials:** In addition to the school rules about integrity and personal conduct outlined in the *Student/Parent Handbook*, students should observe the following guidelines with regard to taking exams at Groton School:

- Study materials should be left in the dorm or in the front of the exam room, not deposited in an out of the way and potentially tempting private spot in the Schoolhouse.
- No studying is allowed during chapel.
- Students should not carry into the exam any unauthorized material, whether in a calculator or computer or smartphone or written or concealed on one’s person. Exam issues or questions should not be discussed except with the teacher, nor should any materials or sources be consulted, during the exam or during breaks, until all exams have been collected.
- Above all, students should use common sense and avoid even the appearance of impropriety; one’s conduct should keep one above the suspicion of inappropriate behavior.

B. **Unexcused absences from final exams**

1. A student may only be excused from an exam by the Health Center, the Dean of Students, or the Academic Dean. Excused absences must be granted before the start of the scheduled exam, but reasonable and unforeseen conflicts that make such permission impossible will be considered. The student must make up the missed exam as soon as possible (as determined by the teacher, Department Head, and Academic Dean). Any student who takes an exam after its originally scheduled time must make certain to adhere to the guidelines of the Groton School Honor Code and refrain from any action that may offer him/her an unfair advantage.

2. Any student who fails to appear for an exam must contact his/her teacher immediately, explain the reason for having missed the exam, and set up a time during which he/she will sit for a make-up of the exam. The student must sit for the exam as soon as is practical (as determined by the teacher, Department Head, and Academic Dean). The student’s exam will be graded according to the teacher’s normal standard, and the score will be reduced by 20 points. The student must pass the exam according to the normal standard (the initial exam grade must be 60 or above and the final grade must be 40 or above), or the student will have to re-take the exam.

3. If a student misses an exam and fails to contact his/her teacher immediately, the student will automatically receive a grade of 40 on the exam. The student will still have to sit for a make-up exam and earn a passing grade, but the 40 will stand.

4. Any student who arrives late for an exam will be permitted to sit for the exam and will be granted no more than the remaining time or 1 ½ hours, whichever is greater, to complete the exam. The teacher will grade the student’s exam according to the normal standard.

5. Teachers will make a reasonable effort to locate students who are missing at the start of an exam and will alert the Dean of Students or the Academic Dean when a student is missing. However, it is the sole responsibility of each student to arrive on time for scheduled exams or to contact his/her teacher directly and immediately to explain an unexcused absence or lateness.

6. While the College Board has its own standards and protocol for the administration of Advanced Placement examinations, all students enrolled in AP-designated courses are expected to take the
AP exam unless they have made prior arrangements with the teacher of the course and the Department Head.
PERFORMING ARTS

The performing arts program at Groton provide students with opportunities to discover their talents, to acquire skills necessary for artistic expression, and to develop an understanding and appreciation of the arts. By studying the performing arts students hone critical thinking skills, and learn about self-expression, creativity, and collaboration.

Students have opportunities to explore coursework in drama and music. They can also participate in the dance and theatre programs as part of the school’s afternoon activities. The hands-on approach to learning lies at the core of Groton’s arts requirement, which emphasizes the value of being actively engaged in a creative process. Groton’s performing arts courses and activities provide essential opportunities for students to express themselves, to become more perceptive, to develop discipline and to enjoy fulfilling lives.

All Second Formers spend a term studying visual arts, a term studying drama and a term studying music. Third Formers may take Choir, Jazz Ensemble, Chamber Orchestra or half-credit music lessons as their required half-credit arts course. All students take a minimum of three credits of art in any discipline(s) in the Upper School. Requirements: All students entering Groton in third form take a half-credit, year-long arts course in music, wood shop, or visual arts. All students are required to take three credits of art in any discipline(s) in the Upper School. Musicking does not fulfill the arts requirement.

DRAMA

8144, 8145, 8146 Second Form Theater (F), (W), (S) L. Sales
Theatre in its simplest form is storytelling, and that is a universal language. In this course students will learn about the various elements that go into theatrical production. Each week will focus on a different skill set, including those of improvisation, lighting, set and costume design, public presentation and dramaturgical research. Students will use their knowledge and creativity to collaboratively explore the ways in which a story can come to life. At the end of the year, the entire Second Form will come together to perform selections from their in-class work.

8377 Improvisation (F) L. Sales
Open to Sixth, Fifth and Fourth Forms. In this course, students will build their foundations as a storytellers by practicing the art of following impulse with artistry and purpose. The course will focus on exercises that allow students to remove creative blocks and fear of performance failure. Through the practice of improvisation games, readings about creative development and non-scripted storytelling assignments, students will learn how to create dramatically interesting characters, relationships and story scenarios. No previous experience onstage is necessary.

8363 From Page To Stage (S) L. Sales
In this course, students will learn how to take a scripted piece through the various stages that culminate in performance. Using short plays written in the winter term playwriting class, lessons will focus on reading texts for playable actions and theatrical throughline, creating vision and implementing design ideas, understanding staging and basic directing principles, and working through the final stages of the technical process and dress rehearsal. This class will feature guest artists who are professionals in the fields of lighting design, sound design, playwriting, directing, scenic design and choreography. Students will walk away with a toolkit of practical skills that will enable them to see a piece of dramatic literature through to fruition. This class will be integrated with the production of the One Act Festival at the end of Spring Term.
SECOND FORM MUSIC COURSES
For one term, each Second Former takes a two-period per week course as a member of the Second Form Steel Drum Ensemble combined with a two-period per week course in Music.

8111 Second Form Steel Drum Ensemble A. Finch
Students participate in a hands-on introduction to music through the use of traditional Caribbean instruments. Students apply their knowledge of music theory while also exploring traditional steel band repertoire and transcriptions from other idioms. Through these activities students learn the skills of listening, teamwork, imagination and risk-taking needed to play in a musical ensemble. The class culminates in an end-of-term performance.

8151 Second Form Musicianship M. Lanier and D. Moriarty
Second Form Musicianship encourages active involvement in different forms of music-making, both individual and communal, helping to develop a sense of group identity and togetherness. Music can influence students’ development both academically and as a member of the Groton School community by fostering personal development and maturity, creating a sense of achievement and self-worth, and increasing students’ ability to work with others in a group context.

As an integral part of culture, past and present, music helps students understand themselves, relate to others and develop their cultural understanding, forging important links between home, school and the wider world. Music develops students’ critical skills: their ability to listen, to appreciate a wide variety of music, and to make judgments about musical quality. It also increases self-discipline, creativity, aesthetic sensitivity and fulfillment.

THIRD FORM MUSIC ELECTIVES
Third Formers may elect one of the following year-long courses in music as their half-credit Third Form arts course. A student who selects Jazz Ensemble, Chamber Orchestra, or Choir may still take music lessons as a non-credit option.

Music Lessons (Y) ½ credit per term Music Faculty
Offered to students with prior or no study as an instrumentalist or singer. Students meet one period per week with their instructor and maintain a journal of daily practice. During the year, students participate in two juries and two community or workshop performances. In addition to practice and performance, students attend the five professional music concerts on the annual Gammons Concert Series.

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8360  Jazz Ensemble  (Y)  
K. Kikuchi
The Jazz Ensemble studies and performs music from both the traditional and contemporary jazz repertoire. Music is selected based on the instructor's goals, student interests, and the solo potentials of individual students. The ensemble rehearses one double and two single periods per week and performs in a variety of venues throughout the year. Membership is by audition or permission of the instructor. A concert tour (domestic or international) is scheduled every third year.

8370  Choir (Y)  
D. Moriarty
Choir gives students instruction in vocal technique and sight-reading, as well as a survey of choral repertoire throughout history and across the world. The choir provides music for the weekly chapel services as well as the annual Lessons and Carols services and the Spring Concert. A concert tour (domestic or international) is scheduled every third year. Membership is open to all.

8390  Chamber Orchestra (Y)  
T. Terranella
The Chamber Orchestra is an ensemble dedicated to learning and performing works at levels that represent hard work and individual concern for the larger group. The Chamber Orchestra meets one double and two single periods per week and performs in a variety of community venues throughout the year. Membership is by audition or permission of the instructor. A concert tour (domestic or international) is scheduled every third year.

UPPER SCHOOL MUSIC ELECTIVES

8350 AP Music Theory (Y)  
M. Lanier
Open to Sixth, Fifth or Fourth Formers. Prerequisite- permission of instructor. Prior study as an instrumentalist or singer is helpful but not required. Students hone skills and acquire knowledge in music theory that will provide the necessary tools to compose and analyze musical works representing a wide range of styles and forms. All composition projects are computer-based. In the Fall Term, students review musical notation; memorize key signatures and scales; study intervals, harmony, tonality, principles of voice-leading, melodic organization, and four-part choral writing; and compose original works. In the Winter Term, students learn to add harmonic flavor in their compositions through the use of dominant seventh chords, leading-tone chords, and non-dominant seventh chords. The Spring Term introduces more advanced topics including key modulations, secondary dominants, and several twentieth-century techniques in composition. Throughout the course, ear training skills are developed in musical software programs, classroom dictation, and sight-singing. Score analysis is included to provide context in which music theory and composing techniques are illustrated. Students will take the AP exam in Music Theory in May.

8310 Jazz Combo (Y) or (W, S) (½ credit per term)  
K. Kikuchi
Offered to jazz musicians. Prerequisite: membership in jazz ensemble and competitive auditions. Limited enrollment. Jazz combo studies a variety of jazz styles and techniques of improvisation. Students present their work in chapel services, special school events on campus and in the greater Groton community.

8360 Jazz Ensemble (Y) or (W, S) (½ credit per term)  
K. Kikuchi
See course description above.

8370 Choir (Y) or (W, S) (½ credit per term)  
D. Moriarty
See course description above.

8380 Chamber Choir (Y) or (W, S) (½ credit per term)  
D. Moriarty
Open to Sixth, Fifth, and Fourth Formers. Prerequisite: membership in choir and competitive auditions.

8390 Chamber Orchestra (Y) or (W, S) (½ credit per term)  
T. Terranella
See course description above.

8400 Select Chamber Music (Y) or (W, S) (½ credit per term)  
M. Lanier
Open to Sixth, Fifth and Fourth Formers. Prerequisite – Audition or permission of instructor. Students experience the challenge of playing soloistic parts in the intimate context of a small ensemble by choosing, studying, preparing and performing selections from the rich chamber music literature.

Music Lessons (Y) (½ credit per term)  
Music Faculty
Open to Sixth, Fifth, and Fourth Formers. See course description and course numbers for Third Form Lessons above.

Full-Credit Solo Performing Arts (Y)  
Music Faculty
Open to Sixth, Fifth, and Fourth Formers. Prerequisite: audition or permission of Ms. Lanier. Solo Performing Arts (SPA) is a year-long course offered to students who demonstrate an intermediate to advanced level of proficiency as an instrumentalist or singer. Students who are interested in having longer practice sessions and approaching their overall training more comprehensively match well with the objectives of this course. Students meet two periods per week with their instructors and maintain journals of daily practice. During the year, students will participate in two juries and two community or workshop performances. In September, students take a music theory placement test. Their instructor uses the results of this music theory evaluation to develop a course of study for music theory to complement their applied lessons. Students who do not qualify for the SPA option may enroll in either Non-Credit Music Lessons or Half-Credit Music Lessons for further training. In addition to performance and practice, students attend the five concerts on the annual Gammons Concert Series.
UPPER SCHOOL FALL TERM MUSIC ELECTIVES

Open to Sixth, Fifth, and Fourth Formers. Anthropologists believe that people began making music before they spoke. Listeners, performers, composers, and improvisers collaborate to form communities of musicers. This course begins with an overview of Western music, including history and context. The overview will include elements of music and what to listen for in music. Next the class will be introduced to ethnomusicology and world music, including popular styles. Finally, students will choose a musical style or a topic they would like to investigate and present to class. Along the way, students will consider music and social context, music and technology, Divas and Divos, dance, and film scores.

UPPER SCHOOL WINTER TERM MUSIC ELECTIVES

8362 Jazz Ensemble: 2-term commitment (W, S) K. Kikuchi
Open to Sixth, Fifth, and Fourth Formers. See course description for 8360.

8375 Music Arranging (W) D. Moriarty
Open to Sixth, Fifth, or Fourth Formers. Keyboard, solfege and counterpoint are important tools for any musician. This course is geared for students who are interested in learning to arrange their own music, using the same principles that have guided composers from Palestrina to Thirty Seconds to Mars. This is a great course for anyone interested in taking their own music to the next level.

8392 Chamber Orchestra: 2-term commitment (W, S) T. Terranella
Open to Sixth, Fifth, and Fourth Formers. See course description for 8390.

UPPER SCHOOL SPRING TERM MUSIC ELECTIVES

8353 Music Technology: Creating and Recording Music in the 21st Century (S) K. Kikuchi
Open to Sixth, Fifth, or Fourth Formers. This course begins with an introduction to the software program, Logic Pro X, a tool for recording and creating music. Students study electronic instruments, MIDI, fundamentals of recording, manipulation and transmission of sound, current developments, and film scoring. Knowledge will be applied as students create their own electronic music and recording projects. Music Technology is a highly practical course with emphasis on utilizing technology to conceive, create, and produce musical ideas, compositions, and productions. Students will be expected to support class time with independent study on a computer and recording equipment.
The course caters to a wide range of musical interests. Assignments allow an element of choice, and the opportunity to apply one’s own style and musical ideas in creating and manipulating musical material.

**INSTRUMENT AND VOICE LESSONS PROGRAM**  
(Credit and Non-credit options)

The design of the Instrument and Voice Lessons Program provides opportunities for students of varied levels of skill and interest and is complementary to any student’s course load. A student may elect to register for half-credit, full-credit, or non-credit lessons. Electing full-credit music lessons places a student in the Solo Performing Arts course. Study of a musical instrument or voice is a commitment that should not be entered into lightly. Lesson preparation requires self-discipline, motivation, and well-structured independent work. All students are expected to attend a weekly class period with their instructors and maintain daily practice routines.

Lessons are offered in all band and orchestral instruments as well as voice, piano (classical and jazz), guitar (classical and electric), banjo, electric bass, bagpipes, piano, organ and harpsichord. **A fee of $48 is applied to each period lesson.**

**Half-Credit Music Lessons (Y)**  
Open to Sixth, Fifth, Fourth Formers. See course description for Third Form Lessons on p. 10.

**Full-Credit Music Lessons - Solo Performing Arts (Y)**  
Open to Sixth, Fifth, and Fourth Formers. See course description above.

**Non-Credit Music Lessons (Y) and (W,S)**  
Weekly lessons with an instructor and daily practice are the main components of music lessons as a non-credit option. This course is open to all students and faculty in the Groton community. Students may sign up for non-credit music lessons during spring course registration by completing the registration form they receive with their other course sign-up materials.

**SMALLER MUSIC ENSEMBLES**  
(Non-credit)

In the setting of a small ensemble, students develop and hone musical and interpersonal skills essential to effective rehearsals and engaging performances. Much responsibility is placed on the players to present their music confidently while understanding the interlocking roles of all parts. The ensembles meet with a coach from the music faculty one period every other week to rehearse and discuss the selected work(s). The full ensemble spends a second period without the instructor during alternating weeks to work on specific goals outlined in the coaching session. If the ensemble members and coach chose, they may meet more frequently.

The following smaller ensembles are offered as non-credit courses. Once a commitment has been made, students are expected to prepare for and attend all rehearsals and performances.

**Chamber Ensembles (F, W, S)**  
Offered to all singers and instrumentalists including pianists. Prerequisite: prior study on an instrument or voice. Preformed groups are encouraged. Students are placed in trios, quartets, quintets, and other combinations and present

M. Lanier
their work in performances on campus and beyond the gates. For placement purposes, students should prepare to perform a solo work for the instructor at the time of registration or at the beginning of the term.

**Piano Ensemble (Y) or two-term commitment (W,S)**
Offered to pianists. Prerequisite: prior piano study. Students are assigned to one piano, four-hand duos to explore this vast and engaging repertoire. Piano duos perform on student recitals, in chapel services, special school events, and other performing venues on campus and in the greater community.

**Brass Ensemble (Y) or two-term commitment (W,S)**
Offered to brass instrumentalists. Prerequisite: prior study on instrument. The Brass Ensemble studies and performs original work and other arrangements found in the brass literature from various periods. The Ensemble presents its work in chapel services, special school events, and other performing venues on campus and in the greater community.

**Jazz Combo (Y)**
Offered to jazz musicians. Prerequisite: prior study on an instrument and some experience playing in jazz idioms. Limited enrollment. Jazz combo studies a variety of jazz styles and techniques of improvisation. Students present their work in chapel services, special school events on campus and in the greater community.

**The Guitar Project (Y or two-term commitment (W,S)**
Offered to guitarists and bass players (limited number). Prerequisite: prior study on instrument and working knowledge of chord progressions. Limited enrollment. Auditions will take place if registration exceeds class size. The Guitar Project explores a wide range of literature including rock, jazz, folk, ethnic, classical, and world music. Students present their work in performances on campus and in the greater community.
SHOP (WOODWORKING)

8210 Third Form Shop (Y) ½ credit per term  D. Brown
Third Formers will make a small piece of furniture. Students may do work which involves dovetailing, turning, mortise and tenon construction, cutting, planning and hand finishing. Because many of the basic processes in cabinetmaking are learned, this course provides a solid introduction to further, more ambitious work in the Upper School.

8310 Upper School Shop (Y)  D. Brown
Open to Sixth, Fifth, or Fourth Formers. Each student in this course will undertake the construction of a significant piece of furniture. Examples of work done in past years include desks, lowboys, tables, chairs and cupboards. The exact project is chosen by the student with the advice and consent of the teacher. No previous woodworking experience is required. Students will be taught what they need to know in the shop.

This is a full credit course. Students taking Upper School Shop for the first time must take it for any three consecutive terms. Others may negotiate individual arrangements, including a term course or one for half credit that would require only half the time commitment stated above. Please consult Mr. Brown before signing up for such a variation on the regular full course.

VISUAL ARTS

8121, 8122, 8123 Art Exploration (F)(W)(S) ½ credit per term  J. Ho
This a Second Form art course, exposing students to the elements and principles of design through exploring various materials. References to major artists from art history and contemporary art create a framework for projects, and personal experience will inform imagery and concepts. Students will use drawing, painting, collage, and sculpture to create individual and collaborative works. Critique sessions will stress ways to look at, analyze, and discuss art.

8240 Art and Design (Y) ½ credit per term  J. Ho & M. De Jesus-Akuete
This is a Third Form year-long course that incorporates a broad range of technical and conceptual skills necessary for visual communication. A wide variety of materials and artistic methods will be introduced, and emphasis will be placed on exploratory thinking and visual problem-solving. Through hands-on experiences with fine art materials, students will learn the basic vocabulary of two- and three-dimensional design, and color theory. Discussions, various media, critiques, and visiting artists will complement studio activity to help students understand the historical, cultural, and contemporary context in which art is created.

FALL TERM STUDIO ELECTIVES

8524 Printmaking (F)  J. Ho
This is an introductory course to basic printmaking. Students are encouraged and taught to develop their original ideas while making monoprints, etchings, woodcuts, embossings and collographs. By studying both the old masters and contemporary artists, students gain an understanding of this ancient art. Printmaking is appealing to both the
beginner and the more advanced student because the image is scratched, carved or drawn on a plate and then transferred to paper through the block printing process or the etching press. Enrollment is limited to eight students.

8527 Painting (F)  J. Ho
Open to Sixth, Fifth and Fourth Formers. This course is an introduction to the techniques of painting with acrylics. Discussions using references from art history and from ancient to contemporary art will enable students to understand the historical and cultural contexts in which art is created. Beginning with color theory, students will learn how to mix paint, and understand color theory. Emphasis will also be placed on composition and value. In a typical term, a student would produce three to four paintings. These might include several portraits, landscape, and mixed media projects. The acquisition of skills will be emphasized as well as opportunities for self-expression.

8534 Drawing (F)  M. De Jesus-Akuete
Open to Sixth, Fifth, and Fourth Formers. This course introduces students to the basic techniques and methods of drawing. Students learn to develop their ability to “see” by exploring different concepts of observational drawing to understand how to place objects and the figure in space. Through the study of line, value, shapes, lights & darks, and shading, students will gain knowledge of how to create a two-dimensional drawing with three-dimensional qualities. A variety of drawing materials and their properties will be explored in order to develop a strong understanding of the medium. Enrollment is limited to ten students.

8544 3D Sculpture and Integrated Practices (F)  M. De Jesus-Akuete
Open to Sixth, Fifth, and Fourth Formers. Students will express themselves in a wide variety of hands-on materials including ceramic, plaster, modeling clay, wood, found objects, and recyclables. Imagery will be informed by the materials and the process-based work. Students will have the opportunity to create site-specific and outdoor installations that comment on the space or topic. Included in this course gallery talks, and trips to local art museums such as the sculpture-based DeCordova Museum. Enrollment is limited to ten students.

8561 Photo 1 (F)  M. Andersson
Open to Sixth, Fifth and Fourth Formers. This course introduces students to basic techniques of shooting, developing, and printing pictures. Using black-and-white film, students will work on short term projects designed to develop their abilities to create vital and effective visual images. Enrollment limited to ten students.

8564 Photo 2 (F)  M. Andersson
Open to Sixth, Fifth and Fourth Formers. Prerequisite: Photo 1. This course builds upon the photographic knowledge from Photo 1, expanding students’ understanding of the descriptive powers of photography and honing technical skills. Enrollment limited to ten students.

8571 Digital Photography (F)  M. Andersson
Open to Sixth, Fifth and Fourth Formers. Prerequisite: Photo 1. This class covers the basics of Adobe Photoshop, digital camera usage and print/negative scanning. The focus is on the creation of expressive, original artwork, with emphasis on artistic quality. Some assignments are given; some are self-generated. Enrollment limited to eight students.

8587 Photography Workshop (F)  M. Andersson
Open to Sixth and Fifth Formers. This is a term-by-term offering designed for students who have completed Photo 1 and 2 or Digital Photo and wish to continue photography at a more advanced level. Students will work with the instructor to design a syllabus suited to the student’s individual experience and interests. On rare occasions, a student who has not completed the prerequisites may take Photo Workshop to undertake a specific project, with the permission of the instructor.

**8601 Portfolio Prep (F)**
Prerequisite: one advanced art course (Drawing, Painting, Printmaking), or with portfolio approval from the department. This course will allow students to focus on preparing and compiling a portfolio along college and university standards. Students will work independently to create works showcasing a strong range of techniques, methods, and materials. At the end of the term, students will exhibit their portfolio work in the Christopher Brodigan Gallery. Enrollment is limited to ten students.

**WINTER TERM STUDIO ELECTIVES**

**8518 Art Without Boundaries (W) **
M. De Jesus-Akuete
Open to Sixth, Fifth and Fourth Formers. This course focuses on the intersection of art with other disciplines such as poetry, music, photography, fashion, and performance. Projects will be two- and three-dimensional and will encourage students to explore art materials in an unconventional way. Students are encouraged to have an open mind and willingness to step outside of their comfort zones. All assignments will be conceptual in nature and will involve the production of creative work that responds to the material & media we will discuss and view in class. Discussions and critiques of artworks will be held to help students develop a strong visual language and understanding of how to analyze artworks. Enrollment is limited to ten students.

**8532 Ceramics (W)**
M. De Jesus-Akuete
Open to Sixth, Fifth, and Fourth Formers. Prerequisite: 3D Sculpture & Integrated Practices or an acceptable portfolio. This course provides a hands-on, comprehensive study of clay, and the ability to work three-dimensionally. Students are given a specific vocabulary to learn and content is emphasized so that students understand the use of clay as a vehicle for personal expression. Methods of hand-building and techniques that enable them to give visual (three-dimensional) form to their ideas are taught. Assignments are conceptual in nature and explore themes such as identity, the environment, and social/political issues. Students who take ceramics for three terms can choose to work on the potter’s wheel as a one-on-one tutorial with the instructor. Enrollment is limited to eight students.

**8545 3D Sculpture and Integrated Practices (W)**
J. Ho
See course description for 8544

**8548 Advanced Printmaking (W)**
J. Ho
Open to Sixth, Fifth, and Fourth Formers. Prerequisite: Printmaking or previous printmaking experience supported with a portfolio. Students will be introduced to intaglio, monotype, and silkscreening, while having the chance to focus on creating an edition series based on a specific printmaking technique of their choice. Printing surfaces will include handmade paper, fabrics, and even sculptural application. Enrollment is limited to eight students.

**8552 Advanced Painting (W)**
J. Ho
Open to Sixth, Fifth and Fourth Formers. Prerequisite: Painting course or previous painting experience supported with a portfolio. Students will begin first by exploring mixed media with art and will spend the term focusing on a specific concept with a paint medium of choice. Works completed will be displayed in various locations around the Circle as students develop an understanding for presenting their work in a professional setting.

**8558 Advanced Drawing (W)  
M. De Jesus-Akuete**

*Open to Sixth, Fifth, and Fourth Formers. Prerequisite: Drawing course or previous drawing experience supported with a portfolio. Students will continue with the process of learning how to “see” by drawing from observation. Subject matter will become more complex in nature and other drawing concepts will be explored such as analytic drawing, life drawing, perspective drawing, emotive drawing, narrative drawing, imaginary/fantasy drawing, etc. We will investigate the development of style through the study of both the old masters and contemporary artists. There will be an emphasis on discovering the “tricks” of drawing and how to make things look real. Assignments are conceptual in nature and explore a variety of themes that allow students to develop their own concepts and ideas. Discussions and critiques will accompany studio activity to help students develop a visual language. Enrollment is limited to eight students.*

**8562 Photo 1 (W)  
M. Andersson**

See course description for 8561

**8565 Photo 2 (W)  
M. Andersson**

See course description for 8564.

**8572 Digital Photography (W)  
M. Andersson**

See course description for 8571.

**8582 Video (W)  
M. Andersson**

Open to Sixth Formers. In this course students will explore cinematic production. Using the medium of video and digital editing, they will produce a few short films. The emphasis is on creating a strong and expressive product, using the narrative flow of cinematic imagery and sound. Enrollment is limited to nine students.

**8588 Photography Workshop (W)  
M. Andersson**

See course description for 8587.

**8602 Portfolio Prep (W)**

See course description for 8601.

**SPRING TERM STUDIO ELECTIVES**

**8529 Painting (S)  
J. Ho**

See course description for 8527.

**8533 Ceramics (S)  
M. De Jesus-Akuete**

See course description for 8532.
8536 Drawing (S)  
M. De Jesus-Akuete  
See course description for 8534.

8543 Printmaking (S)  
J. Ho  
See course description for 8524.

8546 3D Sculpture and Integrated Practices (S)  
J. Ho  
See course description for 8544.

8563 Photo 1 (S)  
M. Andersson  
See course description for 8561.

8566 Photo 2 (S)  
M. Andersson  
See course description for 8561.

8573 Digital Photography (S)  
M. Andersson  
See course description for 8571.

8583 Video (S)  
M. Andersson  
See course description for 8582.

8589 Photography Workshop (S)  
M. Andersson  
See course description for 8587.

8603 Portfolio Prep (S)  
M. Andersson  
See course description for 8601.
Groton encourages the study of Latin and Greek because of particular benefits it offers in the development of language skills and the perspective it offers into our culture in a broad sense. Latin and Greek are the basis for several World Languages and can be useful aids in learning them. However, the study of a classical language is fundamentally different in its approach and goals from that of a modern one. While the learning of a World Language concentrates on developing fluency of speech and listening, the learning of a classical language focuses primarily on the structure of the language itself. It encourages precision with words and offers valuable lessons for close reading and written expression in English.

Beyond language skills themselves, classical languages offer the best access to the cultures of Greece and Rome. These cultures form the basis for much of our modern thinking. Go wherever you wish in literature, history, art, architecture, philosophy, government – even math and science – and you will find that the Greeks and Romans have been there before you. They will not be able to answer your every question, but they will usually have addressed and thought about it with perception. The clarity of their approach, reflected in the kind of language they used, will train you well to pick up on your own thinking where they leave off. To a culture like ours, so preoccupied with its own immediate present, these languages open channels not only to the classical world, but also to all the interwoven cultural traditions through the millennia that separate us.

Classical studies specialize in close reading and mental discipline while opening out onto a wide range of subjects from a readily grasped core.

NOTE: Students who begin a classical language must complete at least two years of that language. In particular, Upper Schoolers who begin Greek should plan their future schedules accordingly.

LATIN

4120 Latin 1 (Y)
The Latin 1 curriculum covers the essential grammar and basic syntax of the language within a year. On a daily basis, students translate practice sentences and longer, narrative passages designed to reinforce grammatical topics and to help develop fluency in the language. Discussion of various topics associated with these readings serves to expand the students’ awareness of a wide range of Roman realities.

4220 Latin 2 (Y)
Latin 2 begins with a quick, thorough review of the essential grammar and syntax covered during the first year of study. In conjunction with this review, students also translate Latin from the Libellus, an episodic survey of Roman history featuring adapted excerpts from Livy and other Roman historians, before moving on to selections from Caesar’s Gallic Wars in the Spring Term. This course aims to make students proficient readers of Latin while providing a good overview of Roman history.

4320 Latin 3 (Y)
Latin 3 aims to develop further students’ proficiency in the language while introducing them to representative works of Latin prose and poetry. Students study prose in the first half of the year, typically selections from the works of Cicero, and poetry in the second half of the year with selections from Vergil’s *Aeneid*.

**4420 Latin 4 (Y)**

Latin 4 offers students the opportunity to continue to read, analyze, and discuss representative works of Latin prose and poetry. In recent years this course has focused on selections from a range of Roman authors including Ovid’s *Metamorphoses*, Catullus’ *Carmina*, Horace’s *Odes* and Vergil’s *Aeneid*. Readings may vary from year to year and are chosen at the discretion of the instructor and the Classics Department.

Sixth Formers take this course on a term-by-term basis.

4421 Latin 4 (F), 4422 Latin 4 (W), 4423 Latin 4 (S)

**4430 AP Latin 4 (Y)**

In this course, students read selections from Books 1, 2, 4 and 6 of Vergil’s *Aeneid* and from Books 1, 4, 5 and 6 of Caesar’s *Gallic Wars*, as required for the Advanced Placement Examination. In addition to translating, discussing and analyzing these passages, students also read in English Books 1, 2, 4, 6, 8 and 12 of the *Aeneid* and Books 1, 6 and 7 of Caesar’s *Gallic Wars*. This course is designated as an Advanced Placement course and thus a full-year commitment for all students.

**4521 Latin 5 (F), 4522 Latin 5 (W), 4523 Latin 5 (S)**

The literature studied in Latin 5 may vary at the discretion of the instructor and Classics Department. In recent years, course topics have included the lyric poetry of Catullus and Horace, the philosophical writings of Cicero, the didactic poetry of Lucretius, comedies of Plautus, and selections from the works of Ovid, Seneca, Apuleius and other Latin authors.

**4621 Latin 6 (F), 4622 Latin 6 (W), 4623 Latin 6 (S)**

Readings are chosen by the instructor.

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**GREEK**

With permission of the department, a Third Former with experience in Latin may choose to take Greek. It may also begin as an elective course in the Sixth, Fifth or Fourth Form. Anyone beginning Greek prior to the Sixth Form is expected to take it for a minimum of two years. A Sixth Former who has already completed the language requirement may take Greek 3 on a term-by-term basis.

**4110 Greek 1 (Y)**

The Greek 1 curriculum is designed to cover most of the essential grammar and basic syntax of the language within a year, along with vocabulary-building and practice in reading.

**4210 Greek 2 (Y)**

In Greek 2 students review and expand upon the grammar and syntax they studied during the first year through the close reading of Greek literature. Readings include selections from Xenophon’s *Anabasis* in the first half of the year followed by selections from Homer’s *Iliad*.
4310 Greek 3 (Y), or for Sixth Formers, 4311 Greek 3 (F), 4312 Greek 3 (W), 4313 Greek 3 (S)
Greek 3 is a reading course. In recent years works read have included Sophocles’ *Antigone* and *Oedipus Rex*, Plato’s *Apology* and *Phaedo* and selections from Homer’s *Odyssey*. Readings may vary from year to year and are chosen at the discretion of the instructor and Classics Department.

4410 Greek 4 (Y), or for Sixth Formers, 4411 Greek 4 (F), 4412 Greek 4 (W), 4413 Greek 4 (S)
Readings are chosen by the instructor.

**FALL, WINTER, and SPRING TERM CLASSICS ELECTIVES**

4611 Archaeology of the Aegean (F) A. Reyes
Open to Sixth Formers. This course is an introduction to archaeological method, followed by the study of early Greece and Crete. Sites studied will include Troy, Knossos, Mycenae, and Pylos. The principal text used will be Hitchcock and Preziosi, *Archaeology of the Aegean*. Classes will combine illustrated lectures with oral presentations by each student, who will also be asked to pursue one or two topics in greater depth in research papers. Enrollment limited to six students.

4612 Archaeology of Greece (W) A. Reyes
Open to Sixth Formers. Greek Archaeology is the study of the architecture, sculpture, and painting of Ancient Greece. The principal text used will be W. Biers, *The Archaeology of Greece*. Classes will combine illustrated lectures with oral presentations by each student, who will be asked to pursue one or two topics in greater depth in research papers. Enrollment limited to six students.

4613 The Art and Archaeology of the Roman Empire (S) A. Reyes
Open to Fifth and Sixth Formers. Roman civilization has provided the culture basis for much of the Western artistic and architectural tradition, and evidence for its influence is even found in early Islamic buildings and art. The class will follow the development of Roman art and architecture from its beginnings in Etruria into Late Antiquity and the Islamic period, using archaeological evidence from Rome itself and its Empire. After a study of material from Rome and other Italian sites such as Pompeii, the class will look at Roman art and architecture in Europe (Provence), North Africa (Carthage, Leptis Magna), Egypt (Alexandria), and the eastern Mediterranean (Petra, Palmyra), followed by a consideration of Roman influence on late antique art and architecture (Antioch, Constantinople, Ravenna). The course will conclude with a brief overview of the classical legacy in early Islamic art and architecture (Jerusalem, Damascus). Students will give oral presentations on particular topics, with three formal essays involving archaeological research submitted over the term. Enrollment is limited to 10 students.
ENGLISH

The English Department seeks to immerse students in the world of writing, the students’ own as well as that of great literature. As they study works that vary in genre, period, author, and origin, their task remains the same: to learn not only what a work means but also how it means. The achievement of great writing, be it The Odyssey or an essay from The New Yorker, lies in how that particular piece is built. While the overall aesthetic impact of writing is never overlooked, students study the structure and tropes that shape such work. We aim to teach our students how to read closely, thoughtfully, and with open minds. In their own writing, they are encouraged to be cogent, lucid, imaginative, and precise. Ultimately, we hope that the skills they develop here will engender a life-long love of reading and writing that will ensure them an active intellectual life beyond Groton.

1110 Second Form English (Y)
Second Form English is designed to develop students’ reading, writing, speaking, listening, and critical thinking skills. Students learn to work collaboratively through class discussions and a variety of group activities. Studying a range of genres, students concentrate on improving their ability to understand plot, character, and main ideas as well as on extending their ability to make inferences and to understand figurative language. All Second Form students read a Shakespearean comedy and To Kill a Mockingbird. Writing assignments range from the imaginative to the analytical, from journal entries to formal papers. Students study grammar formally to provide them with a common language with which to discuss their writing.

1210 Third Form English (Y)
Third Form English strengthens students’ ability to read and write with confidence and precision, as well as to listen carefully and participate respectfully during class discussions. Additionally, students work to craft their own interpretations of the readings. Writing assignments help deepen students’ understanding of the texts and strengthen their analytical skills. Class work consistently stresses clarity of expression and effective organization of ideas. Continuing from their work in the Second Form, students study grammar and mechanics to provide a common vocabulary with which to talk about writing with teachers and peers. By the end of Third Form, students should understand the basic structure of an essay and be increasingly adept at providing evidence to support their thinking. All Third Form students read Oedipus the King, a Shakespearean comedy, and Zora Neale Hurston’s Their Eyes Were Watching God.

1310 Fourth Form English (Y)
In the Fourth Form students move from the study and appreciation of literature in general to an examination of particular genres: short fiction, drama, and poetry. The goal is to provide students with an appropriate vocabulary for discussing and writing about each genre. Writing assignments are divided between the analytical and the personal or creative, with an emphasis on the former. Through opportunities such as performing scenes and reciting poetry, students will gain an appreciation for the spoken word. All Fourth Form students read a Shakespearean tragedy, Fitzgerald’s The Great Gatsby, and Jhumpa Lahiri’s Interpreter of Maladies.

1410 Fifth Form English (Y)
Teachers of this course present thematic and stylistic approaches to literature and encourage the reading, thinking, and discussion appropriate to each. Critical writing is of paramount importance, but students write from personal experience and creatively as well. Writing at this level encourages more sophisticated expression in which students display a keener sense of syntax and structure than in previous years as well as a stronger sense of voice. Most Fifth
Form students choose to take Advanced Placement examinations in English Language and/or Literature at the end of the year. All Fifth Form students read Shakespeare’s *Hamlet* and Toni Morrison’s *Beloved*.

**Sixth Form English:** The only **required** English course for Sixth Formers at Groton is Fall Term Exposition.  
**Note:** While they are required to take only one course in English, we encourage Sixth Formers to consider their programs carefully to be sure that they feel sufficiently prepared in this central subject area. Writing electives will be limited to ten students, and enrollment for other English electives will be limited to twelve or fourteen students. Any student selecting an elective for winter or spring should put down an alternate choice in case of over-enrollment.

**1511 Exposition (F)**  
Open to Sixth Formers. Expository Writing is a required course that focuses on the personal essay. Students read a range of published essays and serve as readers and editors of their classmates’ work. Students typically produce four essays, which they revise extensively with the help of their teacher and peers. The course emphasizes the role of revision in the writing process and the deep relationship between good thinking and good writing.

**WINTER TERM ENGLISH ELECTIVES**

**1525 I am not a Bug: Kafka, Woolf, and Others (W)  
T. Goodrich**  
Open to Sixth and Fifth Formers. While the narrator of Joseph Conrad’s *The Secret Sharer* wonders if he will “turn out faithful to that ideal conception of one’s own personality every man sets up for himself secretly,” Franz Kafka’s *Metamorphosis* opens with the famous line, “As Gregor Samsa awoke one morning from uneasy dreams he found himself transformed in his bed into a gigantic insect.” How is it we fall from the lofty heights of *ideal conception* and into *bugdom*? Through a number of works from the turn of the twentieth century, we will consider this question and others that surface in that particular period. Readings will mostly rise from shorter works, so students will encounter a variety of writers over the course of the term, though the principal novel and longest work we study is Virginia Woolf’s *To the Lighthouse*.

**1535 Dictators and Demagogues (W)  
E. Rennard**  
Open to Sixth and Fifth Formers. What is a dictator? What is a demagogue? Why do people follow them so blindly? This course explores ideas about dictators and demagogues by focusing on literature and films that portray such people, as well as by learning about actual dictators in the world today. Texts and films will include Shakespeare’s Richard III, Bertold Brecht’s *The Resistible Rise* of Arturo Ui (based on Hitler), a Ken Burns’ documentary on the life of Huey Long, and Charlie Chaplin’s *The Great Dictator*, among others.

**1543 Women Writing about Women (W)  
M. Gracey**  
Open to Sixth and Fifth Formers. This course will consider women’s voices in a variety of forms (stories, essays, novels, and poems), the issues these works raise, the roles heroines accept or reject, and the way we as readers respond to the ideas on the page. The reading list will include writings of Mary Wollstonecraft, Charlotte Bronte, Sojourner Truth, Virginia Woolf, Edna St. Vincent Millay, Sylvia Plath, Toni Morrison, Alice Walker, Nora Ephron, and Natasha Tretheway. Writing will take the form of journal responses, analytical essays, and narrative essays.

**1618 Literature of Resistance and Resilience (W)  
V. Maqubela**  
*(not offered in 2019-20)*
Open to Sixth and Fifth Formers. What does it mean to be underrepresented and underserved? What are the implications of being a victim and what language typically or effectively articulates this experience? Is being a member of this group always debilitating or can there be strength in shared misery and in the will to survive? This course uses texts and documentary from a variety of groups not commonly offered in American classrooms. The content requires students to think critically about concepts like privilege, oppression, empathy, and forgiveness. The course asks students to consider the role of the bystander in the presence of discrimination and persecution. Texts may include: *Disgrace* by J.M. Coetzee and *Purple Hibiscus* by Chimamanda Adichie. Films include: “Cry Freedom,” and “A Long Night’s Journey into Day.” The course also studies the countless ways in which humans dominate other humans, and how the oppressed organize themselves in resistance and use their voices to rise against tyranny.

**1642 Playwriting (W)**

Open to Sixth and Fifth Formers. As an introduction to the art of writing for the stage, this course will encourage students to create their own one act plays while developing an understanding of structure, character and motivation. Students will produce a series of written assignments, each of which will emphasize a particular aspect of the playwright’s art, such as developing conflict, believable dialogue, and thematic ideas. The class participates in the Massachusetts Young Playwright’s Festival. Particularly successful plays may be produced in the One Act Play Festival. Students may take the course more than once.

**1652 Poetry Reading and Writing (W)**

Open to Sixth and Fifth Formers. The class will read selections of poems from the past 4000 years from all over the world as students learn to emulate the styles of a broad range of poets and develop their own creative voices on the page. Some poets the class may focus on include Sappho, Li Po, Basho, William Shakespeare, John Keats, Rainier Maria Rilke, Pablo Neruda, Emily Dickinson, Robert Frost., Gertrude Stein, E.E. Cummings, Langston Hughes, Maya Angelou, Okot P’Bitek, Allen Ginsburg, Audre Lorde, Carol Ann Duffy, Billy Collins, and Tracy K. Smith. Students will learn to write ballads, odes, haikus, sonnets, villanelles, and free verse. They will also research the life and poetry of one poet in detail and present that poet and his/her work to the class.

**1672 The Waste Land (W)**

Open to Sixth and Fifth Formers. T.S. Eliot’s modernist masterpiece, *The Waste Land*, is widely considered one of the most important poems of the twentieth century. Woven through the poem are allusions to texts that span across time, such as Dante’s *The Divine Comedy*, the legend of the Holy Grail, Shakespeare’s plays, art, popular song lyrics, Eastern and Western philosophy, the Bible, and the Upanishads. By studying excerpts from these texts, students will explore the way in which Eliot’s intertextuality transformed the way poetry was written. Students will spend the last weeks of the course on a writing project where they will write their own poem, in imitation of Eliot, using material from their own lives (books, songs, film, art etc.) as sources of inspiration.

**1732 Jane Austen (W)**

Open to Sixth and Fifth Formers. The plan is to read three of her great novels (most likely *Pride and Prejudice*, *Sense and Sensibility*, and *Persuasion*) and watch an effective film version of one of these texts. Class discussions, presentations, and writing assignments will ask students to examine why these novels continue to fascinate readers, why a film adaptation can (or cannot) do justice to the text, and why these narratives continue to speak to issues that matter to us today. We won’t, I’m afraid, be able to pull off a field trip to her birthplace in England, but we will do all that we can to immerse ourselves in Austen’s extraordinary world of brilliant writing, incisive social commentary, and timeless matters of the heart and mind.
SPRING TERM ENGLISH ELECTIVES

1523 Moby Dick (S) T. Goodrich
Open to Sixth and Fifth Formers. The bulk of this elective lies in a close reading of Melville’s *Moby-Dick*, but students will also compare Melville’s vision with those of his friend Nathaniel Hawthorne and his contemporaries Emerson and Whitman. Given the nature and length of the core text, however, the bulk of the term is spent with *Moby-Dick* itself. Of particular interest will be notions of religion, difference, the soul, time, and what it means to be human. This being said, the class clearly is not undertaking light reading, and students should be willing to extend themselves despite the cerulean days of spring that might be calling to them. The readings are well worth it.

1536 Reading Film (S) S. Sen-Das
Open to Sixth and Fifth Formers. This course will introduce students to film studies and enable them to “read” a variety of films critically. We will study the cultural and social impact of film in the 20th century, learn the specific language of film, and examine the filmmaker’s use of devices such as symbolism, narrative viewpoint, foreshadowing etc. In our study, we will explore the work of influential directors or “auteurs” such as Alfred Hitchcock, Orson Welles, Akira Kurosawa, Francois Truffaut, Francis Ford Coppola, Jane Campion, Kathryn Bigelow, Jordan Peele, and Alfonso Cuaron amongst others.

1619 “Passing” in Literature (S) V. Maqubela
Open to Sixth and Fifth Formers and taught above the AP level. This course explores the concept of “passing” – when one hides his or her identity in respect to, for example, race, religious affiliation, gender identity, sexuality, and socio-economic status. The course will ask such questions as: What does it mean when one lives a life of passing? What are the underlying factors that prevent an individual from showing up as himself or herself? Is passing about coping or about escaping? How do these narratives help us better understand ourselves? What does it take for individuals to be their true selves? Students will explore how identity is shaped, concealed, and revealed.

1623 Writing Short Fiction (S) J. Capen
Open to Sixth Formers. In a workshop setting, writers in this class read a selection of stories from *The Best American Short Stories* of the year, study Ursula LeGuin’s *Steering the Craft* (exercises and recommendations for fiction writers), and evaluate each other’s short stories. Students typically present a piece of short fiction once a week.

1649 Powwow Highways: Native American Literature (S) E. Rennard
Open to Sixth and Fifth Formers. What is Native American literature? How do we distinguish “authentic” representation from stereotypes? In this course you will read a number of works by contemporary Native American authors, including novels, short fiction, poetry, myths, and non-fiction. You’ll read *Ceremony* by Leslie Silko (Laguna Pueblo) and poetry by Simon Ortiz (Acoma Pueblo), Luci Tapahonso (Navajo), Joy Harjo (Muskogee), and Ofelia Zepeda (Tohono O’odham), among others. You’ll also read short fiction and non-fiction by authors such as Zitkala-Sa (Yankton Sioux) and Vine Deloria (Standing Rock Sioux), and N. Scott Momaday (Kiowa). You’ll be introduced to traditional trickster and origin stories, and you’ll watch at least one film, *Reel Injuns*, a documentary that explores the portrayal of Native Americans in movies. The writing for this course will consist of a reader’s response journal on a novel, a personal narrative related to one or more of your ancestors, and poems focused on place and identity.

1723 Southern Literature (S) M. Gracey
Open to Sixth and Fifth Formers. Writers from the American South after the Civil War seem to possess a unique sense of the past that colors their creative genius; consequently, their literature is populated by characters that make indelible impressions in our hearts. In this course we will read the fiction of writers such as Eudora Welty, Flannery O'Connor, and William Faulkner and consider the burdens and beauties of this rich literary tradition.
HISTORY AND SOCIAL SCIENCE

The History and Social Science Department strives to provide students with an understanding of past events and the differing viewpoints of those who participated in them. We seek to encourage the development among our students of certain historical skills: intelligent questioning, gathering and interpreting data, analyzing concepts, recognizing the significance of historic occurrences, understanding cause and effect, and synthesizing information to produce one’s own interpretation of the past. As a natural consequence of encouraging the development of these skills, we teach students to express their ideas with clarity and vigor in both class discussion and in their writing. Ultimately, we hope that the study of history will become for them a life-long process and provide them with an awareness of complexity and ambiguity as they confront ethical choices in their own lives and seek to unravel meaning in the worlds around them.

6100 Sacred Texts (Y) (Required for the Third Form)
Taught jointly by the Religious Studies and Philosophy Department and the History Department, this course introduces students to the world’s great religious traditions and the cultures that produced them. The course begins with the traditions of the East (Hinduism, Buddhism, and Chinese philosophies) and emphasizes Western religions (Judaism, Christianity, and Islam) as they developed within their historical contexts, including the ancient civilizations of Mesopotamia, Greece, and Rome. This foundational course seeks to develop students’ skills as note-takers, critical readers, analytical writers, researchers, and interpreters of primary sources.

7310 World and the West (Y)
Open to Fifth and Fourth Formers and required of all students in the Upper School. World and the West is a year-long course that carries the human story forward from the year 1000 to present. The course recognizes the central role played by Europe in the development of our own way of life, as well as the need for today’s students to have a better understanding of non-Western cultures. Because of the broad time span it covers, World and the West fills an important role in the larger school curriculum by enabling students to place knowledge acquired in other courses in its proper chronological context.

Students entering The World and the West should be able to write a five-paragraph essay with effective thesis and topic sentences. They should be able to take notes and organize information on their own when preparing for both objective and essay tests. They should have an enhanced capacity for abstract reasoning beyond that expected in the Lower School. Among the many skills taught in World and the West are: an understanding of point of view and the ability to make judgments concerning relative reliability when using primary sources, the ability to use these primary sources in document-based essay questions, the ability to handle multiple-choice questions of a type generally used on standardized national exams, and the ability to engage in spirited but civil class discussions. As they continue to hone their critical thinking and essay writing skills, students will also undertake two research papers sometime during the year. Their instructors lead them through all phases of the process including: identifying an appropriate historical question as a topic, orientation to the library, finding and discriminating among printed sources (whether accessed in person or online), developing an argument based upon this research, understanding of what plagiarism is and how it can be avoided, and formatting proper footnotes and a bibliography according to the University of Chicago style.

Though this course is not designed to prepare students for the Advanced Placement Examination or the SAT Subject Test in either World History or European History, they are welcome to take either exam if they wish. They will need to do substantial extra reading during school vacations in advance of the exam.
7410 United States History (Y)
Open to Sixth and Fifth Formers who have completed The World and the West and required of all students in the Upper School, United States History is a survey course that begins with the pre-Revolutionary War Period and continues through the post-War era. While recognizing the many different cultures that have contributed to the American experience, this course emphasizes the values we all share in common: democratic participation in government, freedom of expression and basic civil liberties, the rule of law, and the relationship between liberty and equality. In addition, students also explore the changing role the United States has played in the world.

U.S. History assumes that upon arrival to the course, students will have a thorough grounding in the foundation skills for historical inquiry taught in Sacred Texts and The World and the West, including the experience of having written major research papers. During the year, students will continue to develop as analytical writers, critical readers and inquiring roundtable discussion participants while enhancing their understanding that our history may be interpreted in many and varied ways.

Though this course is not designed to prepare students for the Advanced Placement Examination in U.S. History, they are welcome to take the exam if they wish.

FALL TERM HISTORY ELECTIVES

Open to members of the Sixth, Fifth, and occasionally Fourth Forms, elective courses allow students to return to topics touched on briefly in one of the survey courses or to encounter new material not offered in the sequence of required courses. They attempt to provide a capstone experience for the Groton students most interested in historical study, and they presume a high level of motivation.

7524 Economics (F) R. Bai
Open to Sixth and Fifth Formers. Understanding economic forces is vital to any good analysis of history or current events. This course will introduce the student to the American economy, including: the basic laws of supply and demand at the marketplace; how an economy is measured and evaluated; the problems of unemployment and inflation; and how Congress, the President, or the Federal Reserve might try to correct any problems in the economy. The student will also learn how the US interacts with its neighbors through trade and finance. If time permits, the class will examine how economies develop over time, and what forces—such as population pressures or political conflicts—may affect the course of their growth.

Economics is a discipline that requires students to be proficient in mathematics and be comfortable with quantitative concepts such as graphs and algebraic equations. A grade of B or higher in Algebra II is highly recommended. This course is reading-intensive, and all students are expected to enter the course with a thorough grounding in the foundation skills for historical study taught in World History.

7527 America in the Philippines: Empire of Liberty (F) J. Wallace
Open to Sixth and Fifth formers. This course may be taken separately or in conjunction with the full year exploration of America’s “Empire of Liberty” from the Philippines to Iraq. While it was founding father Thomas Jefferson who called for American expansionism to convert “dangerous enemies into valuable friends,” it was not until the
In the twentieth century, presidents McKinley, Johnson, and both Bushes took this mission overseas in wars of choice in the Philippines, Vietnam, and Iraq. This series of electives examines the expansion of American military, political, and economic power into Asia and its effects on the home front in the United States.

One of the least studied of America’s recent conflicts, the conquest of the Philippines was actually a foreboding sign of what was to come. This war changed the size, nature, and readiness of the U.S. military. It was America’s first foreign counterinsurgency, our first battle against Islamic separatists, and our first exposure to religious extremist armies, both Christian and Muslim. This course will examine the causes of this conflict in the Spanish-American War, the decision to purchase and colonize the Philippines, the methods used to pacify the population, specific campaigns in the southern islands, and the development of colonial policy. Of particular interest to our study is the relative success in creating a colonial bond that would endure through World War II, when Americans and Filipinos worked side by side against the Japanese. Was this success a fluke, or should the lessons of the Philippines have been better heeded in the wars afterward?

Completion of the US History requirement is strongly recommended, but not required. Participation is particularly important in this course, and so students should be ready to engage regularly in spirited but civil class discussions. Required texts may include *Overthrow* (Kinzer), *The Philippines: From Earliest Times to the Present* (Woods), primary sources, and other materials.

**7571 Racism and Genocide (F)**

T. Lamont

Open to VI and V Formers. This course examines the nature of racism and genocide by exploring in detail the history of anti-Semitism and the Holocaust and of the Atlantic Slave Trade and slavery in North America. Students will also conduct independent research on other episodes of genocide and ethnic conflict in places such as Cambodia and Rwanda. Readings will be primary sources including, Frederick Douglass, *Narrative of the Life of Frederick Douglass, a Slave*, Olaudah Equiano, *The Interesting Narrative and Life of Olaudah Equiano*, or Gustavas Vassa, *the African*, Primo Levi, *Survival in Auschwitz*, and Elie Wiesel, *Night*. Students are expected to be able to conduct research independently and engage classmates in spirited but respectful and effective discussion and debate. Students should be able to write well-organized and comprehensive essays that reflect an understanding of the topics and an appreciation for the relevance of the material.

**7574 The Russian Revolution: Leninism and Stalinism (F)**

R. Spring

Open to Sixth and Fifth Formers. This course will examine the Russian Revolution from the creation of the Bolsheviks through Joseph Stalin’s consolidation of power and subsequent purges. In particular, it will focus on Vladimir Lenin’s role in shaping the communist movement, the February and October Revolutions of 1917, the Civil War, and the struggle for power following Lenin’s death. From that point, the course will study Stalin’s Five Year Plans and his use of terror throughout the 1930s. In addition to historical texts, primary documents, and scholarly articles, personal memoir and foreign film will help students develop a thorough understanding of the period. Potential texts/sources include Sheila Fitzpatrick’s *The Russian Revolution* and the Academy Award winning film *Burnt by the Sun*.

**7577 Modern India: Tigers, Elephants, and Cell Phones (F)**

T. Lamont

*not offered in 2019-20*

Open to Sixth and Fifth Formers. Limited to 13 students. This course examines the recent history of India, the world’s most populous democracy and an emerging global power in one of the world’s most volatile and important regions. The course covers Indian history since 1707, the date that most Indians consider the beginning of modern India. The course starts with an examination of three important events of since the turn of the century, each of which illustrate
the link between the present and the past. The next unit takes us back to the arrival of Europeans during the 17th century, the twilight of the Mughal Empire, the establishment of the “British Raj” in 1857, and the rise of the Indian Independence movement. The third unit looks at post-Independence India and the struggle to create a nation. The final unit examines India today, with a focus on the dramatic changes that have occurred since 1991. A particular theme of the course is the push and pull of Indian tradition in the face of European colonization and modernization. The main text is A Concise History of Modern India, 3rd ed., by Barbara D. Metcalf and Thomas R. Metcalf, and supplementary readings are from Sources of Indian Tradition, Volume 2, by Stephen Hay, ed., From Plassey to Partition: A History of Modern India, by Sekhar Bandyopadhyay, India After Gandhi, Ramachandra Guha, India and Pakistan: The First Fifty Years, by Selig Harrison, ed., In Spite of The Gods: The Rise of Modern India, by Edward Luce, and India: From Midnight to the Millennium and Beyond by Shashi Tharoor. Students are also expected keep abreast of unfolding events in India and South Asia through various news media.

7597 Power and Politics I: Media and Elections (F) 
S. Spring
(not offered in 2019-20)
Open to Sixth and Fifth Formers. John Locke, Thomas Hobbes, and Jean-Jacques Rousseau each had his own beliefs about the relationship between citizens and the state. After considering these philosophical departure points, this course will explore different types of linkages between the citizenry and the state—including elections and media as well as political parties. Comparisons will be made among the U.S., U.K., Mexico, Nigeria, Russia, China, and Iran. Students will consider each nation’s society and citizenry, its political behavior, and the impact of culture on campaigns and elections, paying special attention to the current U.S. election cycle. As well as a comparative politics textbook, students will deepen their understanding of each case study with careful consideration of recent news coverage in the U.S. and abroad. (With some additional exam preparation and reading, students who take the first two terms of Power and Politics could take the AP Comparative Government exam.) The text for the course is Shanto Iyengar’s Media Politics (3rd edition).

WINTER TERM HISTORY ELECTIVES

7522 Economics (W) 
R. Bai
See description for 7524

7535 America in Vietnam: Empire of Liberty II (W) 
J. Wallace
Open to Sixth and Fifth Formers. This course may be taken separately or in conjunction with the full year exploration of America’s “Empire of Liberty” from the Philippines to Iraq. While it was founding father Thomas Jefferson who called for American expansionism to convert “dangerous enemies into valuable friends,” it was not until the twentieth century that presidents McKinley, Johnson, and both Bushes took this mission overseas in wars of choice in the Philippines, Vietnam, and Iraq. This series of electives examines the expansion of American military, political, and economic power into Asia and its effects on the home front in the United States.

The winter term will examine the controversial American war in Vietnam from the point of view of both cultures, focusing on why it divided their populations and how it changed the political landscape of both countries. It will study the causes of conflict during and after World War II, the path towards US involvement in Vietnam, crucial turning points in the conflict such as the Tet Offensive and the My Lai Massacre, and the impact of the war on American society. The class will place special emphasis on the experience of soldiers on the ground using visiting veterans, autobiographical sources, and selected works from the body of fiction written about the war (such as The Things They Carried, A Rumor of War, Bloods, and A Viet Cong Memoir).
Completion of the US History requirement is strongly recommended, but not required. Participation is particularly important in this course, and so students should be ready to engage regularly in spirited but civil class discussions. Required texts may include Overthrow (Kinzer), The Vietnam Reader (O’Nan, ed.), The Tunnels of Cu Chi (Mangold and Penycate), and others.

**7538 International Relations (W)**
T. Lamont
Open to Sixth and Fifth Formers. (Limited to 14 students) This course examines major issues in international relations today such as regional conflicts in places such as the Middle East and Asia, and globalization and the growth of transnational agencies and economies. Students learn about the international challenges facing both the United States and the world at large. The starting point of the course is a look at differing theories of International Relations and how US foreign policy is made. Students then conduct extensive research to prepare for role-plays and debates on a variety of topics including Sino-American relations, the proliferation of weapons of mass destruction, and humanitarian intervention. In addition, students play the board game, Diplomacy, a simulation of international relations. Most Readings are articles from the archives of Foreign Affairs magazine, and other readings include articles from journals such as Foreign Policy, The National Interest, Current History, The American Interest, and The Foreign Policy Association’s Great Decisions series. Students are expected to be able to conduct research independently and engage classmates in spirited but appropriate and effective discussion and debate. Students should be able to write well-organized and comprehensive essays that reflect an understanding of the complexity of international relations and consider solutions to difficult questions.

**7545 Court and the Constitution: Individual Liberty and the Law (W)**
J. Lyons
Open to Sixth and Fifth Formers. This course examines the role of the Constitution and the Supreme Court in American life with respect to individual liberty. The focus in the term will be on individual rights in the development of the Court’s jurisprudence from the framing of the Constitution to the work of the contemporary Court. This study includes the origins and development of judicial review, the nationalization of the Bill of Rights and the “incorporation controversy,” and the development of substantive due process adjudication with respect to individual liberty and the right to privacy. The term usually ends with a public mock court simulation of a recent Court decision dealing with the privacy right. This exhibition includes written briefs, oral argument, and written opinions. The readings for this class include excerpts from relevant monographs, legal briefs, Court opinions, and documents related to the syllabus.

Students are expected to possess a survey knowledge of US History, an ability to exploit resources in the library and on-line and write clear analytical essays. In addition, students are expected to contribute their thoughts, ideas, critiques and perspectives to class discussion as a means of developing their own analytical framework in interpreting constitutional issues. By the end of the term, it is hoped students will be more purposeful and persuasive in their ability to engage in textual analysis of legal briefs and opinions, summarize and assess historical/constitutional concepts and themes, make historical/juridical connections and recognize that the Court’s work is best understood as an interrelated thematic whole. The mock court is a capstone opportunity for students to display a mastery of these skills.

**7575 The Cold War: The Soviet Union and the World (W)**
R. Spring
Open to Fifth and Sixth Formers. This course will focus on the Cold War through the lens of Soviet leadership with particular attention to the importance of ideology, personality, and realpolitik in foreign policy. We will also look at
the global impact of the rivalry between the United States and the Soviet Union and the role it played in various regions, including: Asia, the Middle East, Africa, and Latin America. Potential texts and sources include Vladislav Zubok’s *A Failed Empire: The Soviet Union in the Cold War from Stalin to Gorbachev* and the CNN documentary series *Cold War*.

**7598 Power and Politics II: Dictators and Democrats (W)**  
_S. Spring_  
*(not offered in 2019-20)*

Open to Sixth and Fifth Formers. Both Aristotle and Plato contemplated the role of government and how political order should best be constructed. After considering these thinkers as a theoretical basis, the course will provide students with an understanding of the diversity in world political systems, as well as an introduction to the frameworks political scientists use to compare those systems. Students will explore the historical origins and intents of the institutions in the U.S. Constitution, the United Kingdom’s parliamentary system, and the European Union before considering further case studies and comparisons with the current government structures of Russia, China, Mexico, Nigeria, and Iran. In addition to a comparative politics textbook, this course will include excerpts from political theorists and philosophers, as well as article-length work by modern political scientists and current events coverage in both domestic and foreign media outlets. (With some additional exam preparation and reading, students who take the first two terms of Power and Politics could take the AP Comparative Government exam.) The text for the course is Mark Kesselman’s *Introduction to Comparative Politics* (7th edition).

**SPRING TERM HISTORY ELECTIVES**

**7523 Economics (S)**  
_R. Bai_

See description for 7524

**7526 Modern China: Riding the Dragon (S)**  
_T. Lamont_

Open to Sixth and Fifth Formers. (Limited to 13 students) This course examines Chinese History since approximately 1600. An important theme is the ongoing struggle between traditional Chinese social and political culture and the forces of change. A particular focus is China’s response to the West during the 19th and early 20th centuries and the impact of Communist rule since then. At the end of the course, students examine the significant challenges facing China and its people today and the implications for China and the world. Students are expected to engage classmates in spirited but appropriate and effective discussion and debate. Students should be able to write well-organized and comprehensive essays that reflect an understanding of the complexity of Chinese History. The main text is Orville Schell, *Wealth and Power: China’s Long March to the 21st Century*, and Jung Chang, *Wild Swans*, and excerpts from many sources including J.D. Spence, *The Search For Modern China, A Documentary Collection*, P.B. Ebrey, *Chinese Civilization, A Sourcebook [documents collection]*, E. Snow, *Red Star Over China*, Nien Cheng, *Life and Death in Shanghai*, and Yuan-tsung Chen, *The Dragon’s Village*. Students are also expected to keep abreast of unfolding events in China through various news media. Students are also expected keep abreast of unfolding events in China and East Asia through various news media.

**7537 America in Iraq: Empire of Liberty III (S)**  
_J. Wallace_

Open to Sixth and Fifth Formers. This course may be taken separately or in conjunction with the full year exploration of America’s “Empire of Liberty” from the Philippines to Iraq. While it was founding father Thomas Jefferson who called for American expansionism to convert “dangerous enemies into valuable friends,” it was not until the twentieth century that presidents McKinley, Johnson, and both Bushes took this mission overseas in wars of choice in
the Philippines, Vietnam, and Iraq. This series of electives examines the expansion of American military, political, and economic power into Asia and its effects on the home front in the United States.

After World War I, the West played an important role in the creation of Iraq as a multinational state under Sunni minority leadership, but it later jilted that leadership in the name of democracy. The United States was involved—either directly or indirectly—in three different conflicts in Iraq in the past forty years: the Iran-Iraq War, Operation Desert Storm, and Operation Iraqi Freedom. While only the last two were commanded and fought by American military, neither would have happened had the United States not supported Saddam Hussein’s regime in the first. This course will examine these wars in terms of: their successes, their failures, and their effects both on the stability of the Middle East and the American body politic. The war in Afghanistan, American past operations in Iran and the wider Middle East, and the recent conflicts in Syria and Yemen will be used as a compliment and contrast to the study of Iraq.

Completion of the US History requirement is strongly recommended, but not required. Participation is particularly important in this course, and students should be ready to engage regularly in spirited class discussions and graded negotiation exercises. Required texts may include *Overthrow* (Kinzer), *Never Split the Difference* (Voss), and others.

7546 American Conservatism, 1945-present (S)  
A. Reichenbach
Open to Fifth and Sixth Formers. In 1950, liberal critic Lionel Trilling proclaimed that “Liberalism is not only the dominant but even the sole intellectual tradition,” for “the plain fact that nowadays there are no conservative or reactionary ideas in general circulation.” The nascent ideas that were maturing even before Trilling’s bold statement have grown and spread over the last 70 years, firmly planting Conservatism as one of America’s dominant political traditions. This course will examine the Conservative intellectual movement in America since World War II, focusing on the ideas and intellectuals that have created, accelerated, or described the rising revolt against liberalism. The key goal of the course will be to define American conservatism. Is it an ideology or a tradition? Are conservatives necessarily reactionary, or on the Right? What is the relationship between conservatism and the Republican party? Can one big tent contain libertarians, traditionalists, Rockefeller Republicans, arch-reactionaries, necons, paleocons, and crunchy cons? We will answer these questions and more through primary sources written between 1945 and today that furthered the Conservative dialogue. We will start with authors such as William F. Buckley and Russell Kirk and end with current commentators like Ross Douthat and Jonah Goldberg. The story will hang together with the help of George Nash’s *The Conservative Intellectual Movement in America Since 1945*, which will serve as a textbook and reference work for most of the course.

7556 The Court and the Constitution: Equal Protection and the Law (S)  
J. Lyons
Open to Sixth and Fifth Formers. This course examines the role of the Constitution and the Supreme Court in American life with respect to the Fourteenth Amendment’s guarantee to the equal protection of the laws. Students will examine the scope and meaning of the Court’s adjudication in this area. Most of their inquiry will look at the Court’s work in this area since the Second World War with respect to race, ethnic origin, gender and sexuality. We begin with a brief examination of the meaning and scope of the equal protection clause in the early decades following the ratification of the 14th Amendment, its evolution in the 1930’s and 40’s, and its dramatic expansion in the 1950’s with the *Brown v. Board of Education* decisions. The class traces the Court’s equal protection jurisprudence across the landscape of racial segregation, gender discrimination, and ethnic classifications. This study includes an array of issues that define equal protection interpretation in recent decades, including school desegregation, busing, voting rights, employment discrimination, affirmative action and same-sex marriage. The
readings for this class include excerpts from relevant monographs, briefs, opinions, and documents related to the syllabus.

Students are expected to possess a survey knowledge of US History, an ability to exploit resources in the library and on-line and write clear analytical essays. In addition, students are expected to contribute their thoughts, ideas, critiques and perspectives to class discussion as a means of developing their own analytical framework in interpreting constitutional issues. By the end of the term, it is hoped students will be more purposeful and persuasive in their ability to engage in textual analysis of legal briefs and opinions, summarize and assess historical/constitutional concepts and themes, make historical/juridical connections and recognize that the Court’s work is best understood as an interrelated thematic whole. The end-of-term mock court, often conducted against students from either Deerfield or St. Mark’s, is a capstone opportunity for students to display a mastery of these skills.

7579 Collapse and Transition: The Fall of Communism and the Rise of Putin (S) R. Spring
Open to Fifth and Sixth Formers. This course will focus on the demise of the Soviet Union and its empire as well as the transition to democracy and capitalism after 1991. It will look at the problems within the Soviet state as well as the Eastern European Revolutions of 1989. Finally, students will study recent developments within Russia under Boris Yeltsin and then Vladimir Putin. Potential texts and sources include Stephen Kotkin’s, Armageddon Averted: The Soviet Collapse, 1970-2000 and Masha Gessen’s The Man Without a Face: The Unlikely Rise of Vladimir Putin.

7599 Power and Politics III: Politics of Race, Gender and Ethnicity (S) S. Spring
(not offered in 2019-20)
Open to Sixth and Fifth Formers. Using a range of readings and sources, this course will examine “identity” politics concerning race, gender, and ethnicity. Students will explore the meaning of various labels as well as their own sense of identity before a detailed introduction to social science methodology—including a research design project investigating concerns on campus and beyond. For the second half of the course, the main topics will be issues of identity politics in the U.S. (including race and housing, gender and elections, and ethnicity and media coverage) as well as current academic work concerning similar issues in other parts of the world, especially several African countries. Course materials and readings will cover an intersection of sociology, political science, gender studies, and history.
WORLD LANGUAGE

The study of World Language is an integral part of the Groton curriculum. By learning to speak a new tongue, Groton students open windows to other peoples and to other cultures. It is imperative in the present day that citizens of the world be able to communicate with each other; learning a language may offer one of the best paths to understanding another culture. Our curriculum offers students the skills needed to speak, read, write, and understand other languages, and enables students to be well-prepared for college courses or for opportunities to study abroad. Students learn skills needed to take tests such as the Advanced Placement examinations or SAT II: Subject Tests. Students must take one language through level 3 or continue through the Fifth Form, whichever comes later. Students taking a second World Language must continue through level 2 of that language unless given special permission by the Department.

CHINESE

3140 Chinese 1 (Y)
This beginning course lays the foundation for Modern Mandarin Chinese language study. Speaking, listening, reading and writing are all components of this course. Pinyin (the most widely used Chinese phonetic system) will be introduced as a tool to learn the spoken language. Students learn tones, radicals (the building blocks of Chinese characters), practical vocabulary and basic grammatical structures in the context of family, school and social lives. Classes are conducted in Chinese; students are encouraged to speak as much Chinese as possible from the very beginning. Throughout the year, cultural elements and activities will be introduced.

3240 Chinese 2 (Y)
This course continues to develop listening, speaking, reading and writing skills in daily situations, with an emphasis on grammar and vocabulary expansion. Classes are conducted entirely in Chinese to encourage students' oral and aural skills. Contents are organized around natural conversational topics, such as weather, hobbies, doctor's visit, sports and travel. Students practice speaking and writing via cultural activities, songs, poetry and small skits.

3340 Chinese 3 (Y)
This course focuses on deepening cultural competence and understanding through authentic texts, articles, and video material. Oral skills are stressed; students learn to apply grammar and vocabulary in conversations, skits, oral presentations and debates. Students also read an exciting series of short stories and practice more lengthy writing in different genres and topics.

3440 Chinese 4 (Y)
This course reviews more advanced grammatical structures with an emphasis on fluency and accuracy in writing Chinese across a variety of genres. Students are exposed to current events and social issues in China through newspaper articles, movies, television broadcasts and literature. Topics include education, social reforms, and economic development. Students will work on improving their listening, speaking, reading, writing and analytical skills through class discussion, oral presentations, debates, and essay writing.
Sixth Formers may use the following course sequence:
3441 Chinese 4 (F), 3442 Chinese 4 (W), 3443 Chinese 4 (S)
3540 Chinese 5 (Y)
This course prepares students for the AP Chinese and Culture Examination in May. Students continue to explore social issues in China from the previous year; topics include gender, environment, investment, etc. In addition, cultural topics—festivals, music, culinary culture, ancient philosophies, and so on—will be studied both in breadth and in depth. Students will be familiarized with the AP Exam format and will work on improving their language and analytical skills through class discussion, oral presentations, debate, and essay writing. Any Sixth Former who chooses this course as a term elective will have it listed as Chinese 5 and may take it for one, two, or three terms. Sixth Formers may use the following course sequence: 3541 Chinese 5 (F), 3542 Chinese 5 (W), 3543 Chinese 5 (S).

FRENCH

3150 French 1 (Y)
This class lays the foundation for language study. Classes are conducted entirely in French in order to develop strong oral and aural skills. Students study the present, the passé composé, and the imperfect, as well as other grammatical structures. Vocabulary is introduced in the text, in class, through short stories, and through visual aids.

3250 French 2 (Y)
In the second year of French, there is an increased focus on grammar, verb form and usage, and vocabulary. Every verb tense is introduced for both regular and irregular verbs. Vocabulary expansion is a priority. Classes are conducted entirely in French to encourage students' oral and aural skills. Cultural conversations, small skits, and oral drills are designed to encourage students to speak French as much as possible. Vocabulary is introduced in the text, in class, through short stories, simple poems, and through visual aids.

3350 French 3 (Y)
This course offers a total review of grammatical structures including the subjunctive mood. It emphasizes speaking and writing, as well as vocabulary development. Oral skills are stressed, including pronunciation, conversation, and oral presentations. Current texts include Breaking the French Barrier, Level III, Astérix et le Tour de Gaule, and Le Petit Prince.

3450 French 4 (Y)
This course includes the reading of short stories, plays, and a novel, by Ahmadou Kourouma, Matthieu Delaporte, Alexandre de La Patellière, Yasmina Reza, Fouad Laroui, as well as the review of current events through newspaper articles and television broadcasts. Teachers will make use of situational vocabulary, oral presentations, essay writing, reading comprehension practice, and a thorough review of complex grammatical structure when needed, with an emphasis on making vocabulary and grammar practical both orally and in writing. Sixth Formers may use the following course sequence: 3451 French 4 (F), 3452 French 4 (W), 3453 French 4 (S)

3550 AP French Language (Y)
This course is an advanced course focusing on developing fluency in all areas of the language including reading, writing, listening, and speaking. It follows the AP Language curriculum and discusses various themes through current events, movies, literature, and other sources. Students present their work in creative skits, debates, and essays. Classes are conducted in French for an immersion experience. Students signing up for this class as yearly
commitment will be expected to take the AP Language and Culture examination. Any VI Former who chooses this course as a term elective will have it listed as French 5 and may take it for one, two, or three terms. Sixth Formers may use the following course sequence: 3551 French 5 (F), 3552 French 5 (W), 3553 French 5 (S).

**3671, 3672, 3673 French 6: Advanced Readings (F), (W), (S)**
Prerequisite: French AP Language. In this course students will continue their study of French literature. They will also read and study poetry, plays, short stories, or novels from the Francophone world. A unit might be devoted to the history and evolution of French cinema. Students will continue to be immersed in a French-speaking environment. They will work on developing their oral and analytical skills through discussion of literature, using a more sophisticated vocabulary.

**SPANISH**

**3110 Spanish 1 (Y)**
This course lays the foundation for language study. Students learn three tenses: present, preterite, and imperfect. They learn many practical vocabulary words related to families, houses, school, food, and transportation. Writing, speaking, listening, and reading are all components of this course. Classes are conducted in Spanish, and students have numerous opportunities to speak. The current text is *Breaking the Spanish Barrier, Level I*. Throughout the year, students read short chapter books and periodically watch video programs.

**3210 Spanish 2 (Y)**
In the second year, students expand their grammatical foundation. The present perfect, pluperfect, future, conditional, future perfect, and conditional perfect are considered. In addition, the subjunctive mood is presented, including the present perfect subjunctive, as well as formal and familiar commands. Vocabulary expansion is a priority. Students give oral presentations, participate in skits, listen to dialogues and songs, and speak and write extensively. They also read an exciting series of short fiction. The current text is *Breaking the Spanish Barrier, Level II*.

**3310 Spanish 3 (Y)**
This year is the final intense year of grammatical study. The subjunctive mood is studied in great depth, including the imperfect subjunctive. Intensive review and amplification of grammar, vocabulary, and sentence structure occur throughout the year. The current text is *Breaking the Spanish Barrier, Level III*. Students also read collections of short stories and articles from the Internet, which they discuss in class. Short videos and movies are viewed periodically for cultural content.

**3410 Spanish 4 (Y)**
The focus of this course is on improving language skills, written and oral—vocabulary, grammar review, reading, and conversation. A student will do periodic reviews of important grammar and will make frequent presentations in class. Speaking and listening skills are especially emphasized. Thematic units include travel, high-tech, food, animals, music, and sports. Films and television documentaries are viewed periodically.
Sixth Formers may use the following course sequence: 3411 Spanish 4 (F), 3412 Spanish 4 (W), 3413 Spanish 4 (S)

**3510 AP Spanish Language (Y)**
This course is an advanced paced course focusing on developing fluency in all areas of the language including reading, writing, listening, and speaking. Students present their work in creative skits, debates, and essays. In class, students continue to acquire vocabulary, review grammatical rules, and read representative literature. Students are immersed in Spanish-speaking cultures through literature, television programs, music, and presentations. Students will be expected to take the AP Language and Culture in May. Any VI Former who chooses this course as a term elective will have it listed as Spanish 5 and may take it for one, two, or three terms. Sixth Formers may use the following course sequence: 3511 Spanish 5 (F), 3512 Spanish 5 (W), 3513 Spanish 5 (S)

3611, 3622, 3619 Spanish 6: Advanced Readings (F), (W), (S)

In this course students will delve into Spanish and Latin American literature through the reading of different authors as well as viewing films by different cinematographers. The purpose of the course is for the students to develop their conversational and analytical skills while acquiring more sophisticated vocabulary through the discussion of the course material. The course is open to students who have completed AP Spanish Language. All courses will be conducted in Spanish. Term courses might come from the following topics: Borges, Historical Fiction, and Esperpento; Historias sobre la historia; A survey of Spanish literature from Spain to the Americas; La ciudad y los perros; Mexico and its Ghosts; Cien Años de Soledad; Periodismo Narrativo.

SINGLE TERM WORLD LANGUAGE ELECTIVES

3557 International News for advanced French students (F)  R. Stanton
(not offered in 2019-20)
This course will take a look at issues that happen currently around the world. It is opened to advanced students of French (levels 5 and up). Students will read articles, prepare and lead discussion on a daily basis, Reading and discussion will be done in French. The group will be encouraged to write a blog for the school, in French, summarizing current events of the week.

3558 North African Francophone Literature (W)  R. Stanton
(not offered in 2019-20)
Students of advanced levels of French (levels 5 and up) will be reading and analyzing novels, short stories and essays written by contemporain francophone authors from North Africa (Morocco, Lebanon, Algeria, Tunisia.) We will discuss the content of the reading and will put the events and ideas discussed in a historical and current events perspective.

3559 International News for Advanced World Language Students (S)  R. Stanton
(not offered in 2019-20)
This course will take a look at issues that happen currently around the world. It is opened to advanced students of French, Spanish and Chinese (levels 5 and up) and native speakers. Students will read articles, prepare and lead discussion on a daily basis. Reading will be done in the language students are studying. Discussion will be done in English. The group will be encouraged to write a blog for the school, in the language they are studying, summarizing current events of the week.
The Religious Studies and Philosophy Department equips students with the means to examine critically and objectively fundamental truths about humanity, its place within the universe, and human understandings and experiences of ultimate, greater realities. Its course offerings share a common commitment to the reasoned and respectful exploration of beliefs and issues crucial to human existence and to the development of the student's capacity to comprehend and evaluate questions that pertain to life, what gives life meaning, and what is ultimately true and real.

Religious literacy is a central component of preparatory education in an increasingly connected global society. The Department aspires to foster a more humane, aware, and conscientious student and it neither presumes nor promotes the particular ideals and values of any single system of belief. Its course offerings compel students to reflect actively upon responsible, consciousness-raising education as a component of meaningful social diversification and their overall intellectual and personal formation.

Students in the Third Form are required to take and complete the Sacred Texts and Ancient Peoples course. Students who enroll in the School after the Third Form are required first to complete the Comparative Religion course. Thereafter, all students must complete a minimum of any one-term departmental course offering at any point in or beyond the Winter Term of the Fourth Form, or in the Fall Term of the Fourth Form, pending departmental permission.

**6100 Sacred Texts (Y)** (required for the Third Form)
Taught jointly by the Religion and History Departments, this course introduces students to the world's great religious traditions and the cultures that produced them. The course begins with the traditions of the East (Hinduism, Buddhism, and Chinese philosophies) and emphasizes Western religions (Judaism, Christianity, and Islam) as they developed within their historical contexts, including the ancient civilizations of Mesopotamia, Greece, and Rome. This foundational course seeks to develop students' skills as note-takers, critical readers, analytical writers, and interpreters of primary sources.

**6501 Ethics (F), 6502 Ethics (W), 6503 Ethics (S)**
Why do people do what they do? How do people determine morality and make ethical decisions? What frameworks help societies to formulate ethical questions and examine their conclusions, related conduct, and behavior? This course explores classical ethical theories such as Utilitarianism, Egoism, and Cultural Relativism and examines how they may be applied to contemporary situations that require moral clarity and discernment. Case studies may address such issues as: environmental ethics; abortion and euthanasia; social justice; capital punishment; and, media ethics. The materials for the class include textbook readings, primary sources, popular culture, and news media.

**6611 Comparative Religion (F)**
This course utilizes a comparative and conceptually-based methodological approach to introduce students to the phenomenological study of religion. Students identify fundamental concepts that comprise various manifestations of religious thought, meaning, experience, and behavior. The concepts are then examined within the purview and historical unfolding of five of the world's major religious traditions (Hinduism, Buddhism, Judaism, Christianity, and Islam), in order to compare how adherents of these traditions in diverse times and places have adapted and reinterpreted them, while simultaneously maintaining continuity with their prior forms and expressions. By
employing a methodology that not only is conceptual and historical, but also gives precedence to the first over the second, the course fosters a systematic and critically-disciplined understanding of religion.
The STEM departments, Mathematics and Computer Science and Science, offer courses across a spectrum of individual disciplines. Instruction throughout the STEM program includes attention to a set of key STEM skills and habits of mind. The School is engaged in an ongoing, broad assessment of its STEM curriculum, and the Mathematics and Computer Science and Science Departments’ offerings will continue to reflect the results of this initiative.

Some of the key STEM skills:
- Data analysis
- Modeling
- Programming
- Individual experimentation
- Collaboration
- Presentation using multiple representations of information
- Interdisciplinary problem solving
- Effective and appropriate use of technology

Some of the key STEM habits of mind:
- Defining and analyzing systems
- Basing conclusions on evidence
- Developing logical arguments using the languages of science, mathematics, and programming.

MATHEMATICS AND COMPUTER SCIENCE

The goal of the Groton School math and computer science program is to provide students with quantitative information, problem solving techniques, and the analytical skills required by the changing landscape of the 21st century. Through student-centered discussions, technology-based explorations, discovery exercises, and lectures, we encourage students to investigate and analyze a variety of mathematical models. By exposing students to questions that emphasize theory as well as real world applications, we instill the ability to reason quantitatively and to arrive at solutions in an organized, detailed, and concise way. The Department encourages students to work both individually and collaboratively to solve real world problems. Students are expected to use a range of technological tools including CAS graphing calculators, graphing software, spreadsheets, geometric modeling software, and computer programming to analyze and solve challenging problems. To meet the demands of a rapidly changing world the Department seeks to provide students with essential mathematical and technological skills.

The Mathematics and Computer Science Department courses will continue to reflect the results of the school’s STEM initiative. In all of our courses we intentionally strive to include key STEM skills and habits of mind in both our pedagogy and assessment of student progress.

We place students in courses and sections relevant to their skill level. We offer courses that are designed to provide students with skill in a range of topics in algebra, geometry, probability, statistics, calculus, discrete mathematics, and computer science. Students who complete the math program through Advanced Math Topics are encouraged to pursue the study of more advanced topics on a self-selected tutorial basis. Some notable past tutorials include:
Linear Algebra, Multivariable Calculus, Game Theory, Chaos and Fractals, Object Oriented Programming to name just a few.

Students must successfully complete mathematics through the Fifth Form year or through Trigonometry (the first term of the Precalculus sequence), whichever comes later.

2110 Algebra 1 (Y)
This course is a thorough introduction to algebraic techniques and their applications. Basic algebraic skills will be emphasized, with some use of the graphing calculator. Topics include linear, exponential, and quadratic functions, along with polynomials, factoring and radicals. Technological tools such as graphing calculators and Desmos will be used to investigate various relationships and functions.

2210 Geometry (Y)
Prerequisite: Algebra 1. Geometry is a full year course with the fall and winter terms focusing on Euclidean geometry. Topics covered in the first two terms include fundamentals of Euclidean geometry, congruence and proof, parallel lines, quadrilaterals, polygons and polyhedra, similarity, circles, the trigonometry of triangles, area, and volume. Students will explore these topics using both analytical and quantitative methods. Students will do extensive work with technological tools such as GeoGebra, Geometer’s Sketchpad, SketchUp, and graphing calculators.

During the spring term students will study problems in applied geometry and modeling. Topics may include measuring the area of the Circle with Google Earth and surveying tools, creating parabolic ovens, or applying topics studied in previous terms of the course. Students will use programming and other tools to solve applied problems in geometry.

This course will have an honors section that will cover all of the above topics, but in greater depth and with greater emphasis on problem solving. The department will determine which students are placed in the honors sections. Placement in the regular section puts no restriction on future math courses.

2310 Algebra 2 (Y)
Prerequisites: Algebra 1 and Geometry. This course involves reinforcement and expansion of the skills and concepts presented in Algebra 1. Topics include linear, quadratic, exponential and logarithmic functions, with emphasis placed on modeling of real-life situations. Polynomial functions, rational and irrational functions, and conic sections are also presented. Graphing calculators are used as an exploratory and computational tool. By the end of the year, students are expected to have a solid grasp of the elementary functions.

2330 Algebra 2 (H) (Y)
Prerequisites: Algebra 1 and Geometry. The department determines which students get placed in the honors section. This course will cover everything covered in the Algebra 2 regular course but with added depth and rigor. In addition, students will study the binomial theorem, sequences and series, combinatorics, and probability.

2410 Precalculus (Y)
Prerequisites: Geometry and Algebra 2. This year-long course consists of the following sequence of topics: trigonometry, probability and statistics, sequences and series, and a review of the functions studied thus far. This
review of functions is algebraic and graphical, as well as for use in modeling various mathematical situations. This will be a year-long course for all students except Sixth Formers, who must complete the Fall Term but can then take the next two terms on an elective basis. Sixth Formers may use the following course sequence: 2411 Precalculus (F), 2412 Precalculus (W), 2413 Precalculus (S)

2450 Precalculus (H) (Y)
Prerequisites: Geometry and Algebra 2H and permission of the department. This year-long course consists of the following sequence of topics: trigonometry, polar coordinates, vectors, matrices, statistics, and introductory calculus topics. During the year, there will be an ongoing cumulative review. Students will review topics from previous courses such as functions, combinatorics and probability, logarithms and exponents, and elementary geometry. At the end of the course, students are encouraged to take the SAT Subject Test: Mathematics, Level 2. This will be a year-long course for all students except Sixth Formers, who must complete the Fall Term but can then take the next two terms on an elective basis. Sixth Formers may use the following course sequence: 2451 Precalculus (H) (F), 2452 Precalculus (H) (W), 2453 Precalculus (H) (S)

2460 Precalculus (H) Accelerated with Computer Programming (Y)
Prerequisites: Geometry and Algebra 2H and permission of the department. This is a fast-track Precalculus honors course and consists of the following sequence: trigonometry, vectors, polar coordinates, parametric equations, matrices, transformations in 2D, complex analysis, limits, continuity, and other introductory calculus topics. During the year, there will be an ongoing cumulative review. Students will review topics from previous courses such as functions, probability and combinatorics, and elementary geometry. Students also learn programming in Python and apply it to solving problems from the curriculum. At the end of the course, students are encouraged to take the SAT Subject Test: Mathematics, Level 2. This sequence will be a year course for all students except Sixth Formers, who must complete the Fall Term but can then take the next two terms on an elective basis.

2720 Applied Calculus (Y)
Open to Sixth and Fifth Form Students. Prerequisite: Precalculus. This course aims to provide students with the foundations of calculus in conjunction with its application to calculus-based physics. Combining the theories of both calculus and physics into one course gives students the unique opportunity to make strong connections between math and science in a way that parallel courses may not always allow. Topics likely to be covered include the basic fundamental ideas of calculus (derivatives, integrals, volumes, and basic differential equations) and physics (especially projectile motion, kinetics, and center of mass).

2730 Calculus A (Y)
Prerequisite: Honors Precalculus and permission of the department. This is a year-long course covering differential and integral calculus. Students will be required to take the Advanced Placement Calculus AB examination in May.

2740 Calculus B (Y)
Prerequisite: Successful completion of Precalculus Accelerated or permission of the department. This year-long course covers the material of Calculus A as well as polar coordinates, parametric functions, Taylor and Maclaurin series, and advanced integration techniques, among other topics. Students will be required to take the Advanced Placement Calculus BC examination in May.

2860 AP Statistics (Y)
Prerequisite: Algebra 2 and permission of the department. The topics of study will include exploratory analysis, planning a study, probability, and statistical inference. The topics within each theme emphasize statistical thinking and minimize computational procedures. Students will utilize the powerful statistical package in the TI-Nspire graphing calculator. In all that they study, students will be required to write accurate conclusions that are supported by statistical analysis. Students will be required to take the Advanced Placement examination in May.

**2870 Linear Algebra and Multivariable Calculus (Y)**
Prerequisites: Calculus A or Calculus B and permission of the department. This course is year-long. Half of the course will focus on linear algebra, on matrix theory and linear algebra that will be useful in other disciplines, including systems of equations, the geometry of 3 space, linear transformations, vector spaces, determinants, eigenvalues, similarity, and positive definite matrices. Many applications will be introduced including how Google’s Page Algorithm works and how many social media sites help one find friends. The second half of the course will cover differential, integral and vector calculus for functions of more than one variable. Topics covered will include but not be limited to the following: the extrema and geometry of three dimensional surfaces, calculus based probability models, finding the area of regions and volumes of solids using double and triple integrals in a variety of coordinate systems, line integrals and their applications, and Green’s Theorem. These mathematical tools and methods are used extensively in the physical sciences, engineering, economics and computer graphics.

**2960 AP Computer Science (Y)**
Prerequisite: Algebra 2 and permission from the department. Collectively, courses 2951, 2955, and 2956 constitute the equivalent of a one-semester college level course in computer science. Students wishing to take them in sequence may opt to take them as a year long course under the AP designation. Students enrolled in AP Computer Science will be required to take the AP Computer Science Principles exam in May.

**2970 Data Structures and Advanced Programming (Y)**
Prerequisites: Algorithm Design and Analysis or a demonstrated proficiency with Java and permission of the department. This course takes a project-based approach to learning advanced programming techniques. Using the Java programming language, we will study object-oriented design and other software engineering principles. We will program Conway’s Game of Life to study the behavior of cellular automata and emergent behaviors; we will puzzle over the Towers of Hanoi and contemplate the running time of programs; and we will dabble in artificial intelligence as we code Martin Gardner’s game of Hexapawn (a simplified version of chess). Along the way, we will encounter data structures such as stacks, queues and trees — and we will learn about how to use them to solve various programming challenges. Students who do well in this course will be encouraged to take the AP Computer Science A exam in May, but this course will also address additional topics that go beyond the scope of the AP curriculum.

**FALL TERM MATHEMATICS and COMPUTER SCIENCE ELECTIVES**

**2811 Discrete Mathematics (F)**
Open to Sixth, Fifth, and Fourth Formers. For the 2019-29 school year, Discrete Math (F) will be Iteration.
Prerequisite: completion of Algebra 2. Iteration is the repetition of a process. We’ll use it as a tool to help understand the math behind modeling a wide variety of real-world situations, including but not limited to: your body’s processing of a drug; saving for retirement; spreading rumors; measuring messy coastlines/borders; and the lifespan
of salmon. Along the way, we’ll meet new uses for and gain comfort with sequences and series; exponential, logarithmic, and logistic functions; matrices; fractal geometry; and chaos.

2881 Advanced Math Topics (F)
Open to Sixth, Fifth, and Fourth Formers. For the 2019-20 school year, AMT (F) will be Mathematical Modeling. Prerequisite: Calculus A or Calculus B. In this course we will learn how to use discrete dynamical systems and occasionally differential equations to solve advanced counting and probability problems, as well as to model and analyze situations one finds in the physical and social sciences. In addition, we will look at how the body absorbs and eliminates medicines, various models for how populations grow, the economics of harvesting, why one should think twice before playing roulette, and the basics of genetics.

2951 Computer Science (F)
Prerequisites: Algebra 2 and permission of the department. No prior programming experience is required. This is a first course in computer science and introduces students to the fundamentals of computer programming. Using the Snap! visual programming language (UC Berkeley’s version of Scratch), students will program several classic computer games including pong, hangman, and a platformer. Through these projects, students will learn about programming concepts such as variables, conditional statements, loops, arrays, and functions. Particular emphasis will be placed on iterative design principles and the roles of creativity and abstraction in the programming process. As a capstone to this course, students will design and implement a significant programming project of their choice.

WINTER TERM MATHEMATICS and COMPUTER SCIENCE ELECTIVES

2812 Discrete Mathematics (W)
Open to Sixth, Fifth, and Fourth Formers. For the 2019-20 school year, Discrete Math (W) will be Networks. Prerequisite: completion of Algebra 2. Consider the famous Konigsberg bridge problem. In the Prussian city of Konigsberg, there are seven bridges that cross the river Pregel. The challenge for the citizens of Konigsberg is to take a walk crossing each bridge exactly once. Leonard Euler provided a solution to this problem and he used graph theory to solve it. Whether it is social networks, transport networks or utility networks, the study of networks is crucial to everyday life. What is the cheapest way of laying cable in a town? What is the shortest route for a traveling salesman to travel in order to visit as many towns as possible? What’s the best and cheapest route in a transport network system? Given constraints in a business model, what is the optimum way to adjust your resources to maximize profit? How do you efficiently sort large repositories of data? These discrete math problems have their roots in graph theory and are ones that we will study in this course.

2882 Advanced Math Topics (W)
Open to Sixth, Fifth, and Fourth Formers. For the 2019-20 school year, AMT (W) will be Calculus-based Statistics. Prerequisite: Calculus A or Calculus B. This course uses the tools of calculus to examine basic probabilistic concepts of statistics in a mathematically rigorous way. Topics include: random variables and combinations of random variables; discrete and continuous distributions; unbiased estimators; significance and hypothesis testing; and some multivariate statistics. Unlike AP Statistics, this course will not focus on data or experimental design questions, turning instead to the theoretical.

2955 Computer Networks and the Internet (W)
Prerequisites: Algebra 2 and permission of the department. No prior programming experience is required. This course takes a broad look at what the internet is and how it works. Students will study its origin, evolution, and the underlying technologies that keep it running. Upon completing this course, students will have a solid understanding of what’s happening behind the scenes whenever they visit a website or send an email. We will learn about how computers store and transmit data, and we will consider cyber security questions that arise as we try to keep that data safe and private. Beyond technical details, we will examine the global impact that the internet has on society, the economy, and culture. This course will conclude with a capstone project in which students will explore and present on the impact of a particular computing innovation that they find of interest.

SPRING TERM MATHEMATICS and COMPUTER SCIENCE ELECTIVES

2813 Discrete Mathematics (S)
Open to Sixth, Fifth, and Fourth Formers. For the 2019-20 school year, Discrete (S) will be Introductory Statistics. Prerequisite: completion of Algebra 2. This course provides students with the opportunity to explore select topics of statistics through extensive hands-on work with data. Students will study methods of collecting, displaying, and analyzing data; experimental design; and inference (using data from a sample to draw conclusions about the population from which the sample is drawn). Through the use of calculators and computers, students will discover for themselves how to use mathematical models and simulations for decision making in the real world. This course will not prepare students for the AP Statistics exam.

2883 Advanced Math Topics (S)
Open to Sixth, Fifth, and Fourth Formers. For the 2019-20 school year, AMT (S) will be Cryptography. Prerequisite: Calculus A or Calculus B. Cryptography, the art of scrambling a message so that only the person with the right algorithm can decipher it, has played a crucial role in history. Wars have been won and lost, cities have been defended, monarchs have been executed and banks have been made more secure through the use of cryptography. The cryptanalysts, the people who intercept messages and try to break the cipher, have the harder task to tackle, but once a method for cracking a particular code has been established the secrecy around this solution can sometimes be kept for centuries. In this course, we move from Julius Caesar to Mary Queen of Scot, to Charles Babbage to Hitler and the Enigma machine and finally to RSA and modern day encryption as used on the internet. Besides learning to encrypt and decrypt messages you will also build tools in Python to crack certain ciphers, to simulate the Enigma machine and to encrypt and decrypt using RSA.

2956 Algorithm Design and Analysis (S)
Prerequisites: Algebra 2 and permission of the department. No prior programming experience is required. This course introduces students to the Java programming language and the basics of procedural programming. We will study Java’s type system, why it exists, and how it helps programmers write code that is both correct and efficient. Students will learn techniques for analyzing programming problems and breaking them into simple parts. We will discuss what makes a problem computationally difficult and will examine the limits of what a computer can and cannot accomplish. Additionally, students will master debugging skills and will learn how to reduce redundancy in their code. In short, this course aims to give students the tools they need to become successful programmers. Students wishing to take the AP Computer Science A exam are strongly encouraged to enroll in this course the year before they wish to take the AP exam.
SCIENCE

Groton offers a spectrum of courses in the life and physical sciences. These fields are presented as dynamic and subject to rigorous testing and revision, as has been reflected in the rich histories of each discipline. Teaching of subject content is balanced with work in the laboratory, in the field, and on the computer and is designed to hone the students’ analytical prowess and appreciation for the experimental and collaborative nature of science. Our goal is that all students gain, over the course of their Groton careers, significant exposure to the key STEM skills and habits, and our continued curriculum evolution recognizes the inclusion of these skills and habits as a selective force.

Students who feel that they have already taken the science course suggested for their form should write to the Science Department head by May 1 and include a description of their course syllabus and the name of their text. The Department will determine the most appropriate course assignment for the student and may administer a placement test to provide additional data for its decision.

SECOND FORM: Second Form Science

THIRD FORM: Ecology or Biology

Biology is a dynamic discipline. In recognition of the diversity within this field, the Science Department offers two introductory biology courses that complement each other and allow for multiple tracks through our curriculum—Ecology (5220) and Biology (5310). A Third Form student who wishes a more traditional and less quantitative course should enroll in 5310. A student who seeks a more applied first year in life sciences should choose 5220.

FOURTH, FIFTH AND SIXTH FORMS:
The Upper School science requirement for a Groton School diploma involves the election of one full year laboratory course in science during these last three years. Enrollment in all Upper School science courses is by permission of the Science Department. The following courses meet the diploma requirement for lab science and can be taken in the years listed:

**Fourth Form:** Chemistry, Chemistry (H), AP Chemistry
Environmental Science
Advanced Physics (for those taking Calculus concurrently or previously)
AP Biology (with previous knowledge of chemistry)

**Fifth Form:** Chemistry, Chemistry (H), AP Chemistry
Environmental Science
Physics, Advanced Physics
Advanced Ecology
AP Biology

**Sixth Form:** Chemistry, Chemistry (H), AP Chemistry
Physics, Advanced Physics
Advanced Ecology
AP Biology
SINGLE TERM COURSES: Fall Term, Winter Term, and Spring Term courses for Sixth and Fifth Formers will be offered on a regular basis. However, term courses will not fulfill the diploma requirement. Term course offerings are subject to staffing considerations; not all of them may be available in any given year.

5110 Second Form Science (Lab) (Y)
This course is designed as a hands-on, inquiry-based course that challenges students to make connections across the various scientific disciplines while developing their observational, analytical and quantitative skills to better understand the physical world. This course combines the key elements of the physical science, chemistry, biology and ecology disciplines in the context of our modern environment to prepare students for more advanced science courses. Science skills such as keeping a laboratory notebook, taking accurate laboratory measurements, the understanding, interpretation and presentation of laboratory data, using the metric system and making useful conversions between measurements are emphasized and visited throughout the course. The key STEM skills receiving greatest emphasis in this course, collaboration, presentation and data analysis, will establish a foundation for all future work in this department.

5220 Ecology (Lab) (Y)
Open to Third Formers. This course begins with the study of ecosystem dynamics and energetics, looking at species interactions and the flow of energy through ecosystems. Field studies of the goldenrod and leaf litter communities will provide the basis for exploring these ideas through the development of models and the analysis of the patterns seen in the field. In the winter we will turn our attention to the study of evolution focused on the two billion year history of humans and their ancestors. At the end of the winter we will discuss more recent human evolution and the dramatic effects that our species has had on the planet. During the spring we will explore sustainability and the issues associated with providing food and water for a human population that will likely exceed 10 billion people and the effects that this will have on the Earth’s climate and natural ecosystems. The course is highly quantitative and computers are used to develop models and to collect and to analyze data for all topics.

5310 Biology (Lab) (Y)
Open to Third Formers. This survey course emphasizes diversity within and convergence among all domains at the molecular, biochemical and organismal levels. Evolution by natural selection is fundamental to describing the morphology, physiology and ecology of the biosphere and its components, and is at the core of this discipline. In the laboratory, we teach quantitative analysis, laboratory technique and presentation. It is used to enrich the topics that are presented in lecture. During the Winter Term, students perform a thorough dissection of the fetal pig. The key STEM skills receiving greatest emphasis in this course are defining and analyzing systems, basing conclusions on evidence and modeling.

5400 Environmental Science (Lab) (Y)
Open to Sixth, Fifth, and Fourth Formers. Environmental Science will explore the relationship between the human population, the physical environment, and its resources. The fall term will be devoted to the study of our natural environment, including the biogeochemical cycles that support ecosystems and ocean-atmosphere interactions. In the winter and spring terms, we will discuss human activities that cause damage to the environment at both local and global scales, such urbanization, overpopulation, pollution, and climate change, and how we can start to mitigate the deleterious effects of such activities. Throughout the year, students will be engaged in laboratory work; in the spring, students will carry out ongoing field work and data analysis around the campus to shed light on the anthropogenic impacts on our local ecosystem. Enrollment is limited to 16 students, and preference will be given to students who have completed a year of physical science.
5410 Chemistry (Lab) (Y)
Open to Sixth, Fifth and Fourth Formers. Chemistry is a subject concerned with energy and the properties of matter. The introductory course emphasizes problem solving. By combining molecular visualization and mathematical analysis with laboratory experience, students work individually and in small groups to solve problems ranging from the design of molecules that serve as therapeutic agents for diseases, to the design of instruments that measure the amount of heat energy released in combustion reactions. Topics covered include: atomic and molecular structure, solution chemistry, properties of the liquid, solid and gaseous states of matter, nuclear chemistry, thermochemistry, kinetics, quantum mechanics, organic chemistry and chemical reactivity. The laboratory component of the course emphasizes analytical chemistry skills and scientific communication. The key STEM skills receiving greatest emphasis in this course are data analysis, problem solving, basing conclusions on evidence and forming logical arguments.

5450 Chemistry (H) (Lab) (Y)
Open to Sixth, Fifth and Fourth Formers. Introductory Chemistry and Introductory Chemistry (Honors) will follow the same general progression of topics, but Honors students will be expected to be more comfortable with and adept in mathematical analysis. The Honors course moves at a faster pace in order to allow time to explore topics in greater depth so that the fundamental chemistry concepts and skills can be applied to contemporary topics. Students in the Honors course will be strong candidates for AP Chemistry. Enrollment in the Honors course is subject to the approval of the Science Department.

5510 Physics (Lab) (Y)
Open to Sixth and Fifth Formers. Prerequisite: Algebra 2. This is a full year course with two or three lecture/discussion periods and one or two laboratory sessions per week. The course is designed to familiarize students with the principles of classical physics that govern our everyday experiences. Topics will include Newtonian mechanics, wave behavior and electricity and magnetism. Material will be approached from both conceptual and mathematical perspectives. Course work will include regular problem sets and laboratory experiments summarized in written reports. The key STEM skills receiving greatest emphasis in this course are problem solving, basing conclusions on evidence and modeling.

5610 Advanced Ecology (Lab) (Y)
Open to Sixth, Fifth and Fourth Formers. Prerequisite: students who have completed a year of physical science. Students in Advanced Ecology study the relationships within ecosystems and explore various models to explain the current structure of different natural communities. The course begins with an intense study of several vegetative community types which occur within the Town of Groton, with students learning the dominant plant species and sampling small mammal, reptile and amphibian populations. Working in both upland and wetland systems, students are exposed to different experimental designs, sampling procedures and methods of data analysis. Incorporating Global Positioning System (GPS) technology into a Geographic Information System (GIS), students will analyze the data collected in the field for spatial patterns and will use statistical analysis to explore the relationships between patterns of distribution and their underlying habitat variables. Mathematical models of these patterns will be developed and used as the basis for prediction of the occurrence and abundance of different species. In the winter we will study Conservation Biology, beginning with the study of Population Dynamics and moving into Population Viability Analysis and the design of nature preserves. We will discuss the rationale for the preservation of biodiversity and mechanisms of sustainable development of natural resources. In the spring, students return to the field to look at the effects of climate change on our local ecosystems and to study the vulnerability of different groups to the
changing patterns. Advanced Ecology is a technologically intensive course, relying on data analysis and the development of computer models for all topics. Enrollment limited to 14 students.

5620 Advanced Physics: Mechanics (Lab) (Y)
Open to Sixth and Fifth Formers, Fourth Formers in Calculus. Corequisites: Calculus A or B. During two lecture/discussion periods, one problem-solving period and one laboratory sessions each week, students will learn how experimentation and the techniques of calculus can be used to explore classical mechanics. Time will also be spent examining topics in electromagnetism that have much in common with the mechanical systems studied. Techniques of integration and differentiation will be introduced as needed so students need not have previously completed a course in calculus. Regular assignments will include both problem sets and written laboratory reports. Students who do well in this course will be encouraged to take the Level C AP examination in Mechanics in May. The key STEM skills receiving greatest emphasis in this course are problem solving, collaboration, data analysis and modeling.

5630 AP Biology (Lab) (Y)
Open to Sixth and Fifth Formers. Prerequisites: Ecology or Biology and Physics or Chemistry. These prerequisites may be waived with departmental permission for students of demonstrated ability. In addition, all students who take this course must take the AP Biology Examination in May. AP Biology is comparable to a college freshman biology course in both content and rigor.

This course will follow the AP syllabus as closely as possible and will cover both class and laboratory components. The lab work includes the completion of the 12 required labs and allows investigation of classic and current lab technique. The labs will incorporate computer interfaces, specialized software and collection of data. Major topics covered will include cell anatomy, physiology and biochemistry, heredity and genetics, comparative animal physiology and evolution. Students will complete one presentation that requires them to become conversant with current scientific literature and recent advances/discoveries. Scientific journal readings and discussions will also be utilized to expose students to techniques and protocols prevalent in recent research. The key STEM skills receiving greatest emphasis in this course are collaboration, defining and analyzing systems, forming logical arguments and data analysis.

5640 AP Chemistry (Lab) (Y)
Open to Sixth, Fifth, and Fourth Formers. Prerequisites: Introductory Chemistry and at least concurrent enrollment in Precalculus (Introductory Chemistry Honors is preferred). These prerequisites may be waived with departmental permission for students of demonstrated ability. This course is designed to prepare the student for the AP Chemistry Examination which is taken by all who are enrolled in the course, and is designed to be the equivalent of the chemistry course usually taken during the first year of college by science majors. The following topics will serve as a guide to the content of the course.

I. Structure of matter: including atomic theory and atomic structure, chemical bonding, and nuclear chemistry.

II. States of matter: including gases, liquids, solids and solutions.

III. Reactions: including reaction types, equations, and stoichiometry, equilibrium, kinetics, thermodynamics.

IV. Descriptive chemistry: including the periodic table,
chemistry of metals and non-metals and the physical and chemical properties of the compounds of carbon.

The key STEM skills receiving greatest emphasis in this course are problem solving, defining and analyzing systems, basing conclusions on evidence, forming logical arguments and data analysis.

FALL TERM SCIENCE ELECTIVES

5711 Astronomy: The Distance Scale of the Universe (F)  D. Prockop
Open to Sixth and Fifth Formers. In 1920, leading astronomers gathered in Washington, DC, to attend a debate entitled “The Scale of the Universe.” In 1996, astronomers filled the same hall in Washington to witness another debate entitled “The Scale of the Universe.” Seventy-six years of observational evidence in the interim had completely altered our models of the structure of the universe and shifted the basis for the debate, but to this day, competing methods for establishing the distance scale of the universe yield conflicting results. This scale is essential to almost all models of the history and fate of the universe. Becoming an educated member of the greater audience to this ongoing debate requires acquiring a basic understanding of the structure of the universe and the physical principles governing its evolution.

This course will focus on the dynamics of stellar evolution and stellar systems in order to establish an understanding of objects (including variable stars, planetary nebulae, supernovae and galaxies) that are used as distance indicators in contemporary research. Competing measurement techniques will be studied during four class meetings per week and one evening lab session, during which students will become familiar with the night sky and the rich variety of objects that can be observed through a small telescope.

5721 Human Physiology: Locomotion (F)  P. Marks
Open to Sixth and Fifth Formers. Prerequisites: a life science class; chemistry or physics suggested. Human anatomy and physiology will be covered with emphasis on the systems that allow locomotion to occur: muscles, joints and skeletal. The text will be supplemented with computer-based resources, case studies and projects.

5751 Engineering and the Design Process (F)  A. Hall
Open to Sixth and Fifth Formers who have taken a full-year laboratory science course in the upper school. The course will be centered on group projects as students learn the engineering design process starting from the identification of a need all the way to prototyping in the fabrications laboratory. The class will be learning and progressing through the design process as they take on projects within the community. The students will be able to work on real-world projects with the potential of having important and valuable input during the projects’ design. There will be a significant fabrication component to the course as ideas and designs will become prototypes and solutions as the student familiarize themselves with material properties, including cost, and construction methods. In addition, this course introduces the many fields of engineering and the roles of these disciplines in our society. Throughout the course, an important interlaced theme will be to develop an awareness of professional ethics in engineering and design.

5741 Advanced Physics: Electricity and Magnetism (F, W)  A. Hall
This course will prepare students who have completed Advanced Physics (5620) to take the Level C AP examination in Electricity and Magnetism in May. Doing so will entail conducting extensive experiments as well as completing
regular problem sets in order to learn how experimentation and the techniques of calculus can be used to explore classical electromagnetism.

5754 Organic Chemistry 1 (F)  
T. Maqubela  
Open to Sixth and Fifth Formers. Prerequisite: Completion of AP Chemistry  
This course introduces many of the basic reactions and concepts students will encounter in their future studies of chemistry, biology, or medicine. Rather than covering a large number of reactions, as might happen in a second-year (full year) college organic chemistry course, this course emphasizes an understanding of general principles of reactivity and mechanism. The classroom work is supplemented by demonstrations through which students learn some of the fundamental tools of this highly empirical science. In addition, each student gains detailed knowledge of an area of active research related to organic chemistry. After selecting a topic of interest, each student prepares a paper and a class seminar, using current scientific literature. This course may require more than the standard four to five hours per week of homework.

WINTER TERM SCIENCE ELECTIVES

5722 Human Physiology: Metabolism and Regulation (W)  
P. Marks  
Open to Sixth and Fifth Formers. Prerequisites: a life science class; chemistry or physics suggested.  
Human anatomy and physiology will be covered with emphasis on the major organ systems. The text will be supplemented with the ever-expanding menu of anatomical computer-based resources, case studies and projects. Students will write short focus papers that allow further investigation into the systems we cover. Group work is also an important component of this course.

5738 Engineering Analysis (W)  
A. Hall  
Open to Sixth and Fifth Formers who have taken or are currently taking a full-year course in physics.  
This course introduces the many fields of engineering and the roles of these disciplines in our society. The course is centered around a group project that will follow the engineering design process. Topics covered in the first term of physics will be revisited and expanded upon. Depending upon the particular project, the class will cover different aspects of introductory level statics, material and section properties, loading and design standards. Engineering is not limited to design, so a part of the project will also include performing a cost analysis and exploring constructability and feasibility. In addition, an important theme throughout the course will be an awareness of professional ethics involved in engineering and design.

5742 Molecular Biology (Lab) (W)  
N. Lamarre-Vincent  
Open to Sixth and Fifth Formers who have a solid understanding of DNA and general techniques utilized in molecular biology. AP Biology or Chemistry is preferred as a prerequisite but not required. (Students who lack advanced science background are encouraged to speak with the instructors.) This laboratory-intensive elective will emphasize hands-on molecular biology concepts and techniques. Students will be instructed and guided through a range of current and innovative research level molecular biology/biotechnology protocols. The laboratory research workflow techniques employed in this course will mimic the type of laboratory research performed in colleges, universities and research labs worldwide. Throughout this course, the students will utilize traditional and emerging molecular biology laboratory techniques and bioinformatics. Students will also learn the industry/research standard for maintaining a laboratory notebook. There will be two 75-minute blocks and one 30-minute block. Initially some of the blocks will be utilized for lecture, but as the term progresses, the majority of time will be spent in the laboratory. Students will be graded using both written assignments and laboratory performance. An end of term project presentation will serve as the major assessment. This course is limited to 8 students.
5748 Environmental Chemistry (W)  T. Maqubela
Open to Sixth and Fifth Formers. Prerequisite – any previous Chemistry course. The course opens with the basic principles of Green chemistry. The discussion of “good ozone” which serves as our filter against harmful UV-C and UV-B rays is juxtaposed against the discussion of “bad ozone” in smog production. The greenhouse effect as well as the enhanced greenhouse phenomenon (some refer to the latter as “global warming” implicated in climate change) follows next. We will then discuss the use of fossil fuels, their role in the production of smog and increased concentration of CO₂ in the atmosphere. The discussion turns next to the replacement of leaded gasoline by the addition of MTBE, ethanol and related oxygenates to reduce smog. Attention is turned next to the search for sustainable ways, including purification methods, to bring potable water to exploding populations in the developing world. The pros and cons of the roles of chlorine, ozone and reverse osmosis in the purification of water are compared.

SPRING TERM SCIENCE ELECTIVES

5713 Cosmology - The Structure and Evolution of the Universe (S)  D. Prockop
Open without prerequisite to Sixth and Fifth Formers. In 1929, Edwin Hubble published a paper that spawned the belief that our Universe had a past and will have a future very different from the present. In the years since then, theoretical cosmologists and observers studying supernovae, galaxies, variable stars and the cosmic microwave background have vastly improved our understanding of how the Universe has evolved to a state that allows for our existence.

This course will begin with a brief historical survey of humankind’s quest to understand the Universe in which we live. As this progression reaches the twentieth century, the course will slow down to examine the evidence that has led to revisions in our models. The course will then conclude with consideration of the bizarre implications of discoveries first published in 1998, which cosmologists are still trying to explain. Each week, there will be four daytime class meetings and one evening lab session, during which students will have opportunities to observe and study objects in the night sky that are accessible to small telescopes.

5643 Biochemistry - the Chemistry of Metabolism (S)  N. Lamarre-Vincent
Open to Sixth and Fifth Forms. Prerequisites: courses in both biology and chemistry. How does life on Earth transform and manipulate energy from the sun to grow and reproduce? In biochemistry, we address this question by exploring the biosynthetic pathways involved in the metabolism of sugars, in order to deepen our understanding of the thermodynamic, structural, and mechanistic properties that govern life at a molecular level.

5733 Modern Physics (S)  A. Hall
Open to Sixth and Fifth Formers who have taken or are taking a full-year course in physics. This course will trace the development of modern physics through the 20th Century, beginning with the quantum hypothesis proposed by Max Planck in 1900 and concluding with contemporary research. Topics covered will include quantum theory, special relativity and particle physics. These areas will be approached mathematically where possible, but the primary focus will be on tracing the development of intricate theories and understanding how they inform and alter the way we view the world around us.

5743 Comparative Vertebrate Anatomy (S)  P. Marks
Open to Sixth and Fifth Forms. Coursework in Biology required; experience in/concurrent enrollment in an advanced science course preferred. Hands on dissection required. All vertebrates share a common ancestor. The study of anatomy and physiology through the complete dissection of an organism can reveal the similarities and important differences that have developed between distantly related animals. Through dissection, the student will gain an understanding of anatomy, physiology and learn to make inferences regarding the evolution of anatomical structures. The class time will primarily be devoted to dissection of one aquatic and one terrestrial animal; students will be expected to learn the techniques necessary for careful, precise dissection. Outside of the classroom, students will investigate the history of the dissected organisms and read articles relevant to the discipline of comparative vertebrate anatomy. Students will be assessed through lab practicals and a final project. Limited to ten students.

5756 Organic Chemistry 2 (S)  
T. Maqubela
Open to Sixth and Fifth Forms. Prerequisite is Organic Chemistry 1. The course will be a continuation of the first Organic Chemistry class, focusing on pericyclic and named reactions. Students will be expected to give an extensive presentation on an aspect of physical organic chemistry.
NON-DEPARTMENTAL OFFERINGS

9402, 9403 Public Speaking (W), (S)  L. Sales
Open to Sixth, Fifth, and Fourth Forms. In this one term elective, students will study the skills associated with effective public presentations. Students will study famous speeches from political figures, actors, humanitarians, and athletes and will use these studies to write and perform their own speeches of conviction. Through the process of preparation, presentation and critique students will practice the techniques of professional presentation, including command of voice, tempo, gesture, and body language. This class will also include in-class debates that will allow students the opportunity to practice extemporaneous speaking skills.

9409 Art History (S)  P. Fry
Open to Sixth, Fifth, and Fourth Forms. Learn the fundamentals of art history through the examination of significant works (including painting, sculpture, and architecture) from different time periods and civilizations. Following a chronological sequence beginning with prehistoric cave painting and ending with the High Renaissance, this course will enable students to learn how to analyze works of art from technological, historical, and cultural perspectives. The course will also emphasize why and how the understanding of art history deepens one's understanding of what it means to be a human in an ever-changing world. At least one field trip to a nearby art museum will be scheduled.

9413 Women: an international perspective (W)  R. Stanton
(not offered in 2019-20)
This course is open to Fifth and Six Formers. Through world readings and films students will understand, discuss and analyze critical topics related to women's experiences around the world. The movies we will be watching --in original version-- are drawn from different parts of the world, such as Iran, Israel, Chile, Lebanon, Belgium, China, and will be supported by readings from different countries as well. Their common thread is to provide insight on the role and function of women within their cultural, political, and societal context, as well as a more global view. Discussions will be conducted in English.

9429 New Forms: Cross-Disciplinary Art Since 1950 (S)  M. De Jesus-Akuete
(not offered in 2019-20)
Modern technological and intellectual movements have altered our conception of what art can be. In this course, we will explore a diverse range of genre-defying artists who have created work since 1950. The group may include: Jean-Michael Basquiat, Kara Walker, Yoko Ono, Virgil Abloh, Santigold, Tom Phillips, Solange, Takami Murakami, Childish Gambino, Wangechi Mutu, Jenny Holzner, Marina Abramović, Frank Ocean, Andy Warhol, Ah Wei Wei, and others. As we consider these artists, we will examine the intersections of writing, painting, music, photography, video, fashion, and performance. All assignments will involve the production of creative work that responds to the material we discuss in class. Students will be asked to open themselves to new ideas, art forms, and ways of being.

9566 The Renaissance (S)  I. Gracey
Open to Sixth, Fifth Formers. In the Renaissance, Europe experienced an intellectual rebirth as revived classical ideas inspired a humanistic method of learning. Central to the Renaissance was a belief in “the unique and extraordinary ability of the human mind.” An increased faith in the capacities of men and women provoked profound developments that link the classical and modern worlds. This interdisciplinary course will involve readings in humanistic philosophy, civic responsibility, and the evolving role of religion. Prime focus will be on the visual
representation of these ideas in painting, sculpture and architecture. Sample artists and thinkers for study include Botticelli, daVinci, Pico Della Mirandola, Machiavelli, Michelangelo, and their Greek, Roman, and Christian forebears.
THIS SHEET WILL BE A HELPFUL TOOL IN PLANNING YOUR CREDITS FOR GRADUATION.

To protect yourself, check the requirements that you have already met and anticipate when you will meet those requirements that are still unchecked.

NOTE: Groton School diploma requirements may not be the same as NCAA participation regulations or college/university entrance requirements. Please check with the College Advisors if you have questions.

UPPER SCHOOL REQUIREMENTS

ENGLISH:  ____IV  ____V  ____VI  EXPOSITION

MATH:  ____IV  ____V  ____THROUGH TRIGONOMETRY
(first term of Precalculus)

LANGUAGE:  ____IV  ____V  ____THROUGH LEVEL III

SCIENCE:  ____ONE YEAR LAB SCIENCE

HISTORY:  ____WORLD  ____U.S.

RELIGION:  ____SACRED TEXTS  or  ____COMPARATIVE RELIGION  AND  ____ETHICS COURSE

ARTS:  ____THREE CREDITS IN UPPER SCHOOL

PLANNING SHEET. Plan ahead as far as you can.

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