2026-27
Upper School
Course of Study

Mission Statement

Our mission is to educate students for success at college and beyond, and to foster kindness, respect, and integrity within a safe and nurturing environment. We achieve academic excellence through the development of intellectual curiosity, personal accountability and love of learning.

Our comprehensive program and exceptional faculty and staff help students discover, develop and enjoy their unique talents. We honor individuality, embrace diversity, and promote leadership and service, preparing students to take their place as global citizens.

Table of Contents

(click to go directly to a page)

General Academic Information – Curriculum

The curriculum at The Harker School is composed of a core of required courses which forms the basis of a strong liberal arts education. A broad array of elective offerings, particularly in grade 12, helps to meet the individual needs and interests of students. As a college preparatory school, Harker provides each student with a personal course of study which is challenging but which also offers extensive extracurricular opportunities. Many clubs, activities, sports and performance opportunities are available.

Developing an Academic Plan

Students are asked in grade 9 to develop, with programmatic support, a four-year plan that satisfies the graduation requirements as well as their personal education goals. The purpose is to ensure that students will think through all elective choices carefully. This use of elective courses will help students explore areas of interest and possibly develop depth in those areas of study which most appeal to them. Careful planning helps students avoid being unable to take desired subjects because they have run out of time in their schedules. Advance planning also allows students to make sure they will be prepared for college admissions exams, should they desire to take them. Students will make revisions to their plans in subsequent years, but it is important to draft a realistic plan that extends to graduation.

Graduation Requirements

To graduate from The Harker School, students must:

- complete at least 22 academic credits which must include all required courses and credit totals within each department;
- complete at least two units (four semesters or seasons) of physical education credit;
- complete the 30-hour community service requirement described in the student handbook; and
- abide by the behavior expectations described in the Honor Code and the Code of Conduct in the upper school student handbook available via the parent portal.

Academic credit will only be given for courses taken at Harker.

Academic Planning Chart with Graduation Requirements

The following chart can be used in conjunction with our Student Information System to create the four-year plan. It graphically shows the requirements as well as the slots available for the required (shaded) and elective (not shaded) courses. Students must take a minimum of five academic classes (always including English) for each of their eight semesters and a maximum of six academic classes.

The Extra Period Option courses are not included in this five/six class requirement, but students do earn a grade and one half credit for the year in most (but not all) of these courses. See the course description section for more details, including credit information, on the Extra Period Options which include performing arts (Downbeat, Capriccio, Festival Chorus, Orchestra, Lab Band, Jazz Band, Harker Dance Company and Kinetic Krew), journalism (Introduction to Journalism, News and Yearbook), speech and debate (Introductory, Intermediate and Competitive), and business and entrepreneurship (Principles, Business Leadership). There is no grade for P.E., but students may take a P.E. class during the school day in this Extra Period Option course slot.

		9th	10th	11th	12th	Requirements
1	English	English 1: Study of Literary Genres	English 2: British Lit.	English 3: American Lit	English 4: 2 semester courses or AP English Lit.	4 years
2	Math					3 years 4 recommended
3	Science	Physics	Chemistry	Biology		3 years
4	History	World 1	World 2, AP World or AP Euro	United States		3 years
5	Language	Through level 3				Complete Level 3
6	Arts/Computer Science	Study of Visual Arts, Music, Dance, Theater Arts, Technical Theater				Arts - 1 year Comp Sci - 1 sem.
7	Extra Period Option					
	Total Credits (min)	6	5-6	5-6	5-6	22 credits minimum

English – 4 years/8 semesters
The first three years have a set curriculum. Grade 12 students take AP English Literature or choose two semester-long courses from a list with many options.

Mathematics – 3 years/6 semesters
Students must complete a minimum of three years of mathematics in the upper school and have completed the following courses: Algebra 1, Algebra 2/Trigonometry and Geometry. We strongly recommend that students take four years of mathematics.

Science – 3 years/6 semesters
The three years have a set curriculum and order – Physics, Chemistry and Biology.

History – 3 years/6 semesters
The first and third years are set with, respectively, World History 1 and U.S. History. The second year students choose between World History 2, Honors World History 2, AP World History or AP European History.

Foreign Language – completion of level 3
Students must pass a level 3 or higher course to satisfy this requirement, with at least one of those years completed at the upper school. This does not necessarily require three years of study in the upper school. While we encourage students to continue beyond level 3, and many do, it is not required.

Study of the Arts – 1 year
Students must take a yearlong course in the arts, generally in grade 9. Students choose between Study of Visual Arts, Study of Theater Arts, Study of Music, Study of Technical Theater and Study of Dance.

Computer Science – 1 semester
Students must complete one semester of computer science in a course that emphasizes algorithmic thinking. Some students satisfy this requirement with Digital World, Robotics Principles: Hardware, Programming or Advanced Programming, but students with significant prior in-class coursework may place directly into AP Computer Science A or AP CS A with Data Structures with a placement evaluation (both yearlong courses).

Electives – as desired
Students choose electives as desired to ensure a minimum of five and a maximum of six academic courses at all times and a total of 22 credits by graduation.

Physical Education – 4 semesters (or sports seasons)
Though ungraded, students must complete four semester-long P.E. courses or participate in competitive after-school sports for four seasons. Students can take a P.E. class during the day (instead of having a free period), or students can sign up for an after-school P.E. class. At a minimum, one P.E. class or sports season should be completed each year.

Passing Requirements
Students must earn a D- or higher grade to pass and earn academic credit for a course. Semester grades between D- and D+, while considered passing for high school credit, do not meet many college requirements, including with the University of California and the California State University systems. Students earning a D-, D or D+ in a course required for UC or CalState admissions are encouraged to meet with the assistant upper school division head to discuss remediation. A remediated grade, through coursework completed outside of Harker, does not change the student's Harker transcript but can be used to meet college eligibility requirements.

Academic Policies and Procedures

Students are placed in classes in order to give each individual the pace of learning that is challenging and not overwhelming. Placements are determined by the previous year's performance in a discipline or by proficiency evaluation, in the case of new-to-Harker students. Once the school year begins, a student who is doing well in a grade level section evidences that the student is properly placed at the appropriate level. In the rare case in which the teacher judges that the student's performance proves mastery of content and skills, the teacher, not student, may suggest a change to a more rigorous course.

Adjusting to less rigor in a schedule can be initiated by the student or the teacher. Students can select to move classes until the last week in October. From the teacher perspective, students earning below a B (83%) at any time during a grading period jeopardize their continued placement in an honors or AP section. The teacher may place the student on Placement Review for approximately two weeks or the next major assessment (e.g., unit test). If the grade is not raised within this period, the student will be placed in a non-honors section.

When courses for the following school year are selected at the beginning of the second semester, the student may request to take the next course at the more rigorous level, either honors or sometimes Advanced Placement (AP). Earning a solid A in a grade level course, along with earning department approval, is necessary to move into an honors or AP course in that department for the following year.

Summer School Placement Policies
A student who takes a grade level class during the summer session at Harker will not be moved to an honors section in the fall based on summer performance. Balancing the demands of multiple courses is an important part of the approval process for movement from a grade level class to honors. Also, students who have been approved at the end of the year to take an honors course for the following school year will not be placed in the honors level during the summer; such placements will begin in the fall. Due to the fast-paced nature of the summer course, it is not in the student's best interest to begin the honors sequence in the summer.

Honors and Advanced Placement classes, PSAT/NMSQT, SAT and the ACT

Because honors and AP classes are taught at a more rigorous level than a grade level class, both receive an additional 0.5 grade point added during the GPA calculation. The College Board has designated all AP courses as college level, so students can expect an AP course to be more challenging than the honors courses. Similarly, honors advanced topics courses that follow an AP course are college-level courses that delve deeply into a subject.

When creating their four-year academic plan or modifying it in subsequent years, students (and parents) need to consider the cumulative work load for all the classes in any given year. Students who take an AP class at Harker must take the AP test in that subject in May of that school year. These three-hour, subject-specific tests are graded on a scale of 1 to 5, and depending on the test, the score and the university, students may receive credit towards their college graduation via their AP work. It is the family's responsibility to pay each AP exam fee for which their student sits. The fees will be automatically charged to the student account.

Students take the PSAT/NMSQT (Preliminary Scholastic Assessment Test) for practice in the fall of grade 10. This test yields diagnostic information about a student's testing pattern. The score is not reported to the colleges. Students take the PSAT/NMSQT again in the fall of grade 11. This score is not reported to the colleges, but National Merit Recognition is based on this testing.

It is recommended that students take the SAT or ACT at least once by the second semester of grade 11. The SAT is a three-part test that measures critical reading, writing and mathematical reasoning skills. Each portion of the test is scored on a scale of 200-800. If necessary, the SAT may be taken again in the fall of grade 12. While once is the goal, taking the test twice is not uncommon. Students do not typically benefit from taking the SAT more than three times as scores do not vary significantly. Some students may find that the ACT is better suited to their style of learning and testing. If a college requires a standardized test score in their admissions process, most colleges will accept either the SAT or the ACT. If students feel their PSAT and then SAT scores do not reflect their ability, the ACT can be taken.

Course Descriptions

Course descriptions for every course, separated by department, are given on the following pages. Students are encouraged to read these descriptions prior to signing up for a course. Course and grade prerequisites, if applicable, are given. Most courses include a note that the course is "UC approved." These are courses that students in grade 12, when they are applying to the University of California schools, will be able to include on their UC applications. Some courses include the following note: "This course is an Extra Period Option course." As discussed above, these courses do not count toward the five minimum/six maximum academic course requirement. Unless specified otherwise, semester classes earn one half credit and yearlong courses earn one full credit.

Asterisks * indicate a semester-long course.

Business and Entrepreneurship

The business and entrepreneurship curriculum focuses on developing real-world business acumen, entrepreneurial readiness and innovative skills in students. In order to bolster the conventional high school curriculum, unique education such as business simulations, case studies, competitive opportunities and capstone projects will provide students with one-of-a-kind experiences. Students learn about marketing, finance, management and entrepreneurship through introductory business courses, attending the multiple business and entrepreneurial events held throughout the year, and by participating in the Harker DECA chapter. Students also have the opportunity to complete traditional introductory and advanced coursework in economics.

Principles of Business and Entrepreneurship (1 year/0.5 unit)

The unique characteristic of this course is that it is in a mini-MBA format consisting of four separate modules to be touched upon throughout the year: marketing, accounting and finance, entrepreneurship, and strategy and management. The focus of the course is to deliver a broad-stroke approach to the students, providing essential concepts and principles that are brought into action through a capstone project and competitive event that each module requires. Once these concepts have been mastered and applied for each module, we will delve deeper into each subject through the research and discussion of Harvard Case Studies. Students will apply their learning and live the mantra “learn by doing” as they simulate roles of CEO, consultant, CFO, etc., to bring solutions to complex and extraordinary issues that companies and entrepreneurs often face. Because this is an Extra Period Option course, students may take this course in addition to their full academic loads.

Prerequisite: None

Business Leadership (1 year/not for credit)

Appointed officers of Harker’s DECA chapter will utilize this course to prepare the chapter for competitive success, coordinate professional chapter events and conference logistics, and plan school and community outreach events. The group will be able to more fully collaborate in their leadership of the program and participate together in special opportunities for business professional and managerial preparedness. Officers of the DECA program must enroll in this noncredit, extra period class. Because this is an Extra Period Option course, students may take this course in addition to their full academic loads.

Prerequisite: Application required.

Economics*

This course is a survey course that will introduce students to the basic principles of economics, including both microeconomics and macroeconomics. Key topics include the fundamentals of economics, the theory of supply and demand, elasticity, price controls, market structures, the business cycle, monetary policy, and fiscal policy, among others. Additionally, students will be introduced to basic ideas surrounding personal finance. Students learn through reading, practice problems, simulations, videos and lectures.

Prerequisite: Open to students in grades 10, 11, and 12. UC approved.

Behavioral Economics*

Behavioral Economics examines how psychological, social and cognitive factors impact decision-making. In traditional economic models, humans are considered to be perfectly rational, meaning that they make “perfect” decisions based on price. In practice, human behavior is more unpredictable, or “predictably irrational.” Behavioral economics studies how people respond to stimulus when they make decisions and why they respond that way.

Prerequisite: Completion of Economics or one semester of AP Economics. UC approved.

Honors Entrepreneurship: Startup Incubator I

This two-semester course provides an authentic entrepreneurship experience where students create and commercialize a product or service. Students are led through the Lean Startup processes of developing hypotheses about a business concept, testing those hypotheses, adapting, and continually iterating. Once their business concept has been validated through customer interviews, students receive a seed grant to develop a prototype of their product or service. In addition to seed funding, students are paired with local entrepreneurs and industry experts to help guide them through the process. The businesses created in this course are real – they are not business cases or simulated experiences – which means students will make mistakes, take risks, and learn to pivot based on market research. By the end of the course, students will have a working version of their product or service with initial customers which they will use to pitch a panel of angel and VC investors for funding to fully launch and scale their businesses. Note: This is an honors-level academic course that may not be taken in the Extra Period Option slot.

Prerequisite: Open to students in grades 10-12 interested in experiencing the journey of entrepreneurship. You do not need to have launched a business or even have a business concept in mind to enroll. Application as needed. UC approved.

Honors Entrepreneurship: Startup Incubator II

This two-semester course is designed to help current business owners (both for profit and nonprofit) with scaling their companies as they develop and refine their marketing strategies to drive growth and fulfill customer demand. The course challenges student business owners to think critically about the process of getting, growing and keeping customers/donors. Emphasis is placed on predicting, measuring and analyzing strategies developed and applied to promote business growth. The course is structured in three-week-long “sprints” where students identify their goals and tasks for the sprint, give updates on sprint progress, and deliver a demo of their accomplishments at the end of each sprint. Students receive seed grants and mentorship from local entrepreneurs and industry experts to help accomplish their sprint goals. Students also have opportunities to pitch angel and VC investors for additional funding.

Prerequisites and Wait List Policy: Open to students in grades 10-12 who have launched a business. Priority enrollment will be given to student companies that are actively selling their product/service with a proven business model and demonstrated customer demand (if needed, priority will also be based on seniority). If you are uncertain whether you should be placed in Honors Entrepreneurship I or II, speak with Mr. Acheatel. UC approved.

Honors Corporate Finance*

This course examines how companies choose to invest in new projects, how to finance those projects, and what share of profits to return to investors. Key topics include how companies make decisions, calculate risk adjusted returns, choose to fund with equity or debt, and return cash to investors via dividends or buybacks. Students will select a real public company as a case study to apply what they learn, culminating in a valuation of that company.

Prerequisite: Open to grade 11-12 students who have taken Economics, AP Economics or Principles of Business & Entrepreneurship. UC approved.

Honors Venture Capital & Private Equity*

Honors Venture Capital equips students to become future venture capitalists and allows future founders to explore the process of raising capital from a VC's perspective. The course covers the structure of the VC industry and the specific concerns of individual VC firms. This includes the investing cycle, deal flow and due diligence. Students will run risk analyses of real firms and assess varying deal structures and term sheets. Students will learn and practice the competing methods of valuing a private company. Expect to analyze case studies, conduct market research, produce industry reports, assess the quality of potential new deals, and follow the progress of previously established VC investments. Students will interact with practicing venture capitalists, including the members of the Harker Investment Committee, who will share their expertise.

Prerequisite: Honors Corporate Finance. UC approved.

AP Economics (Micro and Macro)

This yearlong, college-level course, including AP Microeconomics and AP Macroeconomics, begins with a focus on the principles of microeconomics as they pertain to individuals, businesses and organizations within the economic system. The course continues with a focus on the principles of macroeconomics that apply to the economic system as a whole. Students are prepared for the AP Microeconomics and AP Macroeconomics exams in the spring.

Prerequisite: Open to students in grades 11 and 12 who are qualified to take or have already taken Honors Precalculus or who have completed Economics and obtain teacher approval. AP Economics is open to grade 10 students who are concurrently enrolled or have already taken AP Calculus BC. UC approved.

Honors Advanced Topics in Economics: Econometrics

Econometrics is a yearlong, college-level Honors elective course. The course begins with a review of statistics, matrix algebra and calculus. It then progresses to learning econometric modeling with linear multiple regression analysis in the first semester. In the second semester, students will apply linear regression models to real-world examples and learn to identify and correct for common problems such as Autocorrelation and Heteroskedasticity. They will learn to read and interpret journal articles, and work on a research paper to either replicate the analysis from a published econometric paper, or from an original idea.

Prerequisites: AP Economics with B+ or better. Completion of AP Calculus AB or BC or concurrent enrollment in AP Calculus BC or AP Statistics. UC Approved.

Honors Advanced Topics in Economics: Game Theory*

Game Theory seeks to systematically explore the strategic interactions of humans in various contexts from international diplomatic relations to parents and children. Using models for understanding different players, their strategy options, and payouts, game theory can be used to predict the outcome of these strategic interactions given the assumption of rational actors. Different game types include: one-time simultaneous games, repeated games, sequential games, mixed strategy games, threats, promises and the manipulation of games, and possibly the strategy of auctions, negotiations and voting.

Prerequisite: Open to grade 12 students who have completed or are concurrently enrolled in AP Economics. UC approved.

Computer Science

The growth of the computer and electronic industries has contributed to profound and fundamental changes in how we work, play, live and interact with the world. We are surrounded with computers, both hidden and obvious, in all aspects of our lives. The computer science department offers a rich and well-rounded program in technology and computer science, with courses that will appeal to the lay user as well as the computer science-bound student. All students must take at least one semester of computer science prior to graduation.

Digital World*

This course provides an introduction to exciting applications and topics in computer science. Using a combination of in-class discussions, hands-on projects, forum discussions and guest speakers, students learn about digital representations, computational models and abstraction. The course is organized around the study of current topics in computer science. Although specific topics may vary, typical topics include computer architecture and networking, programming, ethical issues in computer science, gaming as a learning platform, and social media and privacy concerns.

Prerequisite: Algebra 1. UC approved.

Programming*

This course helps entry-level computer science students develop their computational thinking skills by applying the basic steps in algorithmic problem-solving and abstraction. Students strategize and discuss solutions and then implement programs that develop their solutions. Throughout the course, students increase their programming skills by analyzing complex problems and decomposing them into smaller more manageable problems, and by doing so, gain not only an appreciation of elegant solutions but also experience the thrill of obtaining them. Students explore virtual worlds with robots and customize robots of their own design, while learning basic programming and algorithmic thinking skills. Students learn object-oriented programming skills such as creating classes, designing and implementing methods, and exploring inheritance. Students use arrays to store objects and then manipulate the objects within the data structure. Students will become familiar with Strings using a subset of string methods. A solid foundation built in Programming will support students when facing the rigors of AP CS A.

Prerequisite: Geometry or Honors Geometry. UC approved.

Advanced Programming*

This course helps students develop their computational thinking skills by applying the basic steps in algorithmic problem-solving and abstraction. Students strategize and discuss solutions and then develop programs that embody their solutions. Students learn to use object-oriented programming concepts such as creating classes, designing and implementing methods, and utilizing inheritance to break complex problems down into smaller, more manageable sub-problems. Students hone their skills to gain a thorough understanding of the technique of recursion, and will become familiar with Strings using a subset of string methods. They will store objects in data structures such as arrays and ArrayLists and then manipulate the objects within. Students not only gain an appreciation of elegant solutions but also experience the thrill of obtaining them. Advanced Programming is a fast-paced course and is for the student who has an intense interest in computer science and intends to follow up with either of the AP computer science courses. At completion, students who earn an A or above are qualified for placement in AP Computer Science with Data Structures.

Prerequisite: Geometry with an A-, or Honors Geometry or better. UC approved.

Robotics Principles: Hardware*

This one-semester, post-programming pre-calculus-based course will focus on the fundamental principles of robotics hardware. Students will learn about the key elements of drive trains, electrical systems, wire routing, sensors, control interfaces and manipulators. The students will learn about these concepts through the use of a small robot car and Robotex Avatar Micro (version 1) military grade ground drones. The students may disassemble/reassemble, document and CAD the existing Avatar subsystems, learn about the design and operational elements, and subsequently design and fabricate their own manipulators that will interface into the drones. A sufficient level of software will also be covered to allow for the control of the custom manipulators.

Prerequisite: None. UC approved.

AP Computer Science A

Students wishing to prepare for the AP Computer Science A examination should complete this course or AP Computer Science with Data Structures. Equivalent to a first-semester college computer science course, APCS is an introduction to the study of algorithms and basic data structures. Using a modern programming language chosen by the College Board, students complete a series of programming projects designed to reinforce the theory learned. Emphasis is placed on good software engineering practices including problem specification, design techniques, documentation and testing. The basic concepts include control structures, arrays, recursion, methods (including preconditions and post-conditions) and well-designed structured code. Students practice their programming skills through multiple projects, including writing Tetris and a word analysis program. Currently, AP CS A uses the Java programming language. Additional information about topics covered is available on the College Board's website.

Prerequisite: Completion of Algebra 2/Trig. Students who complete Programming with an A- or better or Advanced Programming with a B+ or better are best prepared for this course. Students may also self select into AP Computer Science A by reviewing the recommendations for foundational knowledge. UC approved.

AP Computer Science with Data Structures

The purpose of AP Computer Science with Data Structures is to prepare students for the AP Computer Science A exam and challenge students who have demonstrated working mastery of and are current in fundamental programming concepts, since these may not be reviewed. The basic concepts include control structures, arrays, recursion, methods (including preconditions and postconditions) and well-designed structured code. Using a combination of assignments, worksheets and class discussions, students learn to use, create and analyze linked lists, smart arrays, stacks, queues, sets, maps, binary trees, binary search trees, heaps and graphs. Students study a variety of algorithms associated with these data structures along with searching and sorting algorithms and learn how to characterize their performance in terms of both space and time. Programming projects utilize the algorithms and data structures discussed to create a variety of programs including games such as Solitaire, Tetris and Chess. Students are also introduced to the concept of machine learning. Post the AP exam students work on a challenging final project that expects them to apply the knowledge gained during the course. A fitting candidate for this class possesses strong problem-solving skills and works independently, yet seeks help as needed. Specifically, this student has previously written numerous programs to solve math-based and array-based problems. Familiarity with object-oriented programming, particularly Java, greatly aids a student transitioning into this fast-paced, recursion-focused course.

Prerequisite: Completion of Algebra 2/Trig. Students who earn an A or better in Advanced Programming can place directly into AP CS A with

Data Structures. Students who have not taken Advanced Programming but have considerable foundational knowledge may sit for the Computer Science Placement Evaluation in May for access to AP CS with Data Structures. UC approved.

Honors Data Structures*

Honors Data Structures is a one-semester course that introduces elementary data structures and algorithms to students who are fluent in at least one programming language. It is taken by students who have completed AP Computer Science A (not AP CS A with Data Structures) and is typical of the second course in computer science at most universities. Using a combination of programming assignments, worksheets and class discussions, students learn to use, create and analyze linked lists, smart arrays, stacks, queues, sets, maps, binary trees, binary search trees and heaps. Students study algorithms such as traversals, insertion, deletion of information across all these data structures, and learn how to characterize their performance in terms of both space and time. Programming projects utilize the algorithms and data structures discussed to create a variety of programs including games such as Solitaire.

Prerequisite: AP Computer Science A with a B+ or better. UC approved.

Honors Advanced Topics in Computer Science*

Following AP Computer Science A with Data Structures or the semester-long Honors Data Structures course, students may continue their computer science studies with the Honors Advanced Topics courses (ATCS). These semester-long courses are very challenging courses taught at the college level with semester-long projects replacing daily assignments. These courses rotate year to year with the options for the next school year published in January.

Prerequisite: Prerequisites for all honors advanced topics in computer science courses will be: Honors Data Structures with a B+ or better or AP Computer Science with Data Structures with a B+ or better. For Expert Systems and Computer Architecture, students in grade 11 and 12 can take Honors Data Structures concurrently. Subject to instructor approval. UC approved.

Calculus can be taken prior to or concurrently with most ATCS courses. For those courses where calculus is a prerequisite, only grade 12 students may take the course while simultaneously taking calculus.

Topics offered every year:
• Robot Kinematics Software (calculus prerequisite)

Topics offered in a two-year rotation:
• Computer Architecture
• Compilers and Interpreters
• Neural Networks (calculus prerequisite)

Topics offered in a four-year rotation:
• Expert Systems
• Programming Languages
• Numerical Methods (calculus prerequisite)

Honors Advanced Topics Computer Science: Robot Kinematics Software*

In this one-semester course offered each year, students study how to make robots move to achieve useful goals. In typical beginners courses in robotics, the real world has to be simplified to make solutions possible. Such simplifications cannot always be used in the real world, in laser surgery for example. This course examines some practical aspects of robotics interfacing to the real world. Beginning with a review of the mathematics underlying constrained movement (e.g., coordinate transformation using matrices, Jacobi functions, multivariable analysis), students will develop control programs for an articulated robotic arm to be able to thread a needle in various positions, for a robot car to follow a non-uniform curved path and other similar tasks. The practicality of their programs will be tested on robotic arms and vehicles. The course will build on students' mathematical and programming experience to extend problem-solving solution space. Prerequisite: Calculus.

Honors Advanced Topics in Computer Science: Compilers and Interpreters*

In this one-semester course offered every other year, students study how language processors work and how to build a simple language translator. Beginning with a study of lexical and syntactic analysis, students learn how to use regular expressions, extended Backus-Naur grammar specification and how to construct both deterministic and non-deterministic finite state automata. Students will construct a scanner and a recursive descent predictive parser for a subset of the Pascal programming language. Using an Abstract Syntax Tree as an intermediate representation, students will learn the basics of semantic analysis and will then turn their scanner and parser into an interpreter. Finally, students will study compiler backend processing and create a code emitter that will emit code for a MIPS processor. They will demonstrate their completed language translator by running the resulting MIPS machine code on a MIPS emulator. This course is similar in content to the Stanford University course CS143: Compilers.

Honors Advanced Topics in Computer Science: Computer Architecture*

This course, offered every other year, introduces the student to computer architectures based on the Von Neumann or Harvard models. Students study Boolean algebra and digital logic, first building logic gates from transistors, then earning each logic chip they will use by constructing each circuit; i.e., using their previously earned chips to earn the next chip. Students learn combinatorial logic and sequential logic and learn how a memory element can represent an arbitrary set of Boolean expressions. Students design and build finite state machines and learn the relationship between finite state machines and computability. Projects include building an adder, a latch and a counter. This culminates in building a simple 4-bit computer to begin understanding modern computer architecture. Students may then investigate implementing various software strategies such as building stacks and lists using their homebrew computer. This course is similar to the MIT 6.004 Computation Structures course.

Honors Advanced Topics Computer Science: Expert Systems*

This course will cover the history, concepts and implementation behind the theory and development of expert systems and why expert systems are a useful technology in the 21st century. The organizational concepts associated with spreadsheets (one-to-one), relational databases (one-to-many and many-to-one) and subsequently expert systems (many-to-many) will be examined. The operational details of expert system shells and specifically the RETE inferencing algorithm will be explored. The students will learn to develop expert systems using a dialect of the LISP programming language in the Jess expert system shell, which was developed by Sandia Labs. The semester work will culminate in a student project where the students are required to develop an independent expert system application, perform the knowledge collection and engineering and then implement the system based on that knowledge collection. The course is similar in content to university courses on expert systems such as Comp. Eng./Comp Sci. 371 (University of Missouri).

Honors Advanced Topics Computer Science: Neural Networks

In this course the students will develop a basic understanding of parallel distributed processing (PDP) through the incremental development of artificial neural networks based on the fully connected feedforward model similar to the multilayer perceptron. The students will develop an understanding of two models for memory and the differences between them: the “image” model and the “connectivity” model. The students will learn the history of the development of artificial neural network technology, the structure and the components of an artificial neural network. The students will build simple XOR networks from first principles and learn how they are trained and experience the problems associated with execution time and convergence. The construction of the

network will be done in testable incremental steps so that the students understand the low level functionality. The students will subsequently extend their basic network framework to deal with the more complex problem of image recognition. This course is similar to university level courses such as CSA01: Neural Network I at The University of Aizu in Fukushima prefecture, Japan.

Prerequisite: Calculus.

Honors Advanced Topics Computer Science: Numerical Methods*

This course is an introduction to the fundamental elements of numerical methods covering both the basic pure mathematical elements as well as applications in modeling physical systems that utilize those elements. The course introduces basic numerical techniques for finding roots and minima, solving systems of linear equations, integration and differentiation, solving differential equations, and performing integral transforms. These methodologies are then used to model systems that the students have seen in their physics courses. The students may work in any computer language in which they are proficient. The first half of the course is similar to COSC 250 - Introduction to Numerical Methods at Indiana University of Pennsylvania and CS309 at Loyola University Chicago. The application portion of this course is similar to PHYS 404 - Computational Techniques in Physics at the University of Nevada, Las Vegas.

Prerequisite: Calculus.

Honors Advanced Topics Computer Science: Programming Languages*

This course is an introduction and overview to a number of programming languages including, but not limited to, Assembly (6502 and 8086), C, FORTRAN, BASIC, FORTH and LabVIEW. Students will learn the history, purpose, theory and use of each language under study. The strengths and weaknesses of the languages are evaluated and students learn to write programs in each of them. They will examine data storage in terms of stacks, registers, accumulators, program counters, segmented and flat memory models, RISC and CISC chip architecture, integer data types (both signed and unsigned), fixed point and floating point storage, vectorization and simple strings. Students will explore the elements of underflow, overflow, eps, min, max, infinity and not-a-number representations and how each language handles them. After the completion of the course students will have sufficient background to be able to select an appropriate programming language that can most effectively address any particular problem that is under study.

English

The English curriculum focuses on both the teaching of compositional skills and the critical analysis of literature. Students read sophisticated literary works, learn the steps of literary analysis and develop intellectual curiosity and a love of reading. Throughout the four-year program the students become more discerning readers and more effective writers. We foster students' use of clarity, logic, tone and style in their writing.

English 1: The Study of Literary Genres

Grade 9 students study a broad range of literature by reading works in multiple genres: long and short fiction, memoir, drama and lyric poetry. Many of these selections feature variations on the archetypal journey of the hero. Students are introduced to literary criticism in the form of articles written about the course texts. Required readings include *The Joy Luck Club*, *Their Eyes Were Watching God*, *Crazy Brave*, *A Raisin in the Sun*, and *A Midsummer Night's Dream* or *Twelfth Night*. In addition, students read poetry by, among other poets, Angelou, Brooks, Hayden, Heaney, Pastan, Walcott and Wheatley; and short fiction by authors including Bierce, Hemingway, Kincaid, Maupassant, García Márquez, Morrison and Poe. Written assignments include analytical essays, a personal narrative and researched writing. By composing multiple drafts and conferencing with their teachers about their work, students learn to progress beyond simple proofreading to thorough revision of both content and form.

Prerequisite: None. UC approved.

English 2: A Survey of British Literature

Grade 10 introduces the students to British authors from the early modern period to the 21st century. Reading prose, poetry and drama that represents the major movements in British literature, students study these works in their respective social and historical contexts. Readings include *Macbeth*, *The Tempest* (honors), *Frankenstein*, *Homefire*, *The Importance of Being Earnest*, and contemporary short stories. In addition, students study selections of 17th-century writers (Milton, Donne) and of Romantic and Victorian poets, including Blake, Wordsworth, Coleridge, Shelley, Byron, Keats and Browning. Moreover, students expand their base of literary terms as an aid to interpretive reading. The grade 10 course focuses more intensely on the students' development of critical writing skills; students write and revise analytical essays using the comparison/contrast, persuasive and argumentative modes. Individual conferences with teachers ensure that students focus upon improving their writing grammatically and stylistically at both the sentence and paragraph levels.

Prerequisite: English 1 or Honors English 1. UC approved.

English 3: A Survey of American Literature

Grade 11 English focuses on major American authors who have shaped the scope of the American experience. The curriculum progresses chronologically, as it does in grade 10. Students will make thematic connections in works of fiction, essays and poetry across literary periods. Required readings include *The Scarlet Letter*, *The Great Gatsby*, *The Bluest Eye* and *The Interpreter of Maladies*. In addition, students read selections from American literature that include short works and poems by the following authors: Bradstreet, Franklin, Paine, Poe, Emerson, Faulkner, Whitman,

Dickinson, Jacobs, Douglass, Hemingway, Baldwin, Ellison, Hughes and Liu. Students write papers that demonstrate a solid grasp of texts, literary terms and rhetorical patterns introduced in previous courses and hone their skills in critical reading and argumentation.

Prerequisite: English 2 or Honors English 2. UC approved.

ENGLISH HONORS CLASSES

The principal difference between honors and non-honors courses is in the complexity of assignments. Honors sections require more advanced writing skills and greater mastery of grammar and conventions of usage. While all English classes include many and varied papers, those written in honors courses feature greater depth and more comprehensive content. Students demonstrate their ability to express critical evaluations of the texts both in their written work and in their class participation.

Honors English 1: The Study of Literary Genres

UC approved.

Honors English 2: A Survey of British Literature

Prerequisite: Honors English I or English 1 and departmental approval. UC approved.

Honors English 3: A Survey of American Literature

Prerequisite: Honors English 2 or English 2 and departmental approval. UC approved.

ENGLISH ELECTIVES

The English department offers a variety of electives for grade 12 students, which will stimulate their interest through courses that are designed to deepen appreciation for literature. Course offerings focus on genres, literary periods, the history of ideas, individual authors or literary stylistics. Electives offered in the fall semester require a subject-specific research essay. With the exception of AP English: Literature and Composition, grade 11 students, with approval, may take the electives in addition to the required English 3 course.

AP English: Literature and Composition

Students will be introduced to the rich proliferation of literary voices such as W.H. Auden, Jane Austen, Charlotte Brontë, Octavia Butler, Albert Camus, Kamel Daoud, Emily Dickinson, Joy Harjo, Langston Hughes, Nella Larsen, James Joyce, Jhumpa Lahiri, James Merrill, Toni Morrison, Claudia Rankine, Dudley Randall, Sumana Roy, Shakespeare, Zadie Smith, Sophocles, Natasha Trethewey, the author of *Beowulf*, August Wilson and Virginia Woolf. Students will refine their college-bound skills as the emphasis will be on close textual analysis. Emphasis for writing and discussion will be on the critical mode. Essays, peer editing, and teacher evaluation of writing assignments will prepare students for the AP examination.

Prerequisite: Honors English 3 or English 3 and departmental approval. UC approved.

English 4: Asian Masterpieces*

Most students have familiarity with the great epics and novels in the Western tradition which run the gamut from *The Odyssey*, to such novels as *Huckleberry Finn*. Certainly, these works and others represent keystones in their respective genres, but what of the Eastern literary tradition? In this light, Asian Masterpieces seeks to shine the light on the towering figures of modern writing from Asia Minor and the Indian Subcontinent, while simultaneously keeping its feet firmly planted on the grandiose and epic past of these cultures. The course will feature short fiction, novels and poetry, all the while exploring the shifting dichotomies of East and West and old and new, while developing a definition of the immigrant experience in a post-colonial and globalized age. The class will begin with classical texts that could include the mythical epics of India, Myanmar and Mongolia, and then shift focus to writers of the post-colonial era; which may include Rushdie, Lahiri, Pamuk, Gibran, Roy and others.

Through reading, writing, group activity and spirited discussion, students will formulate their own individual answers to the question: How does Asia's mythos influence the writing of the present, and what do modern writers in the Asian diaspora teach about creating meaning in a world wherein globalization blurs the line between East and West?

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Black American Literature

This course explores the rich and diverse contributions of African Americans in American literature. The course's prose, poetry and non-fiction selections engage and frame some of the defining debates and dynamics within African American cultural history: the status of realist aesthetics in Black writing, the contested role of literature in Black political struggle, the question of diaspora, the dynamics of intraracial racism, and the emergence of Black internationalism. The course begins by investigating racial identity in the aftermath of the Jim Crow era and the Great Migration. It then explores how African Americans use autobiography as a form of resistance against Eurocentric ideas of Blackness. The course also features the relationship between the Civil Rights struggle and our cultural response to it and considers Afrofuturism as a space for resistance and liberation for the oppressed. Readings include poets such as Langston Hughes, Maya Angelou, Amiri Banks, and others; and prose selections such as Toni Morrison's *Jazz*, Richard Wright's *Black Boy*, Ta-Nahisi Coats' *The Water Dancer* and Octavia Butler's *The Parable of the Sower*. In addition to literature, the course also investigates song, poster art and film. Beyond exploring this rich, diverse literary tradition, students will also actively write, debate and hone their skills of close reading and analysis.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Gothic Literature: Vampires and the Macabre*

This course is designed to explore the origins and development of the Gothic genre, its generic conventions and its influential impact on the literary world. It will investigate the beginning of the movement (as a rejection of the logic and reason of the Age of Enlightenment), its links with Romanticism (emotional excess and sentiment), and its emphasis on terror, horror, psychology, and social commentary and criticism. Students will address important questions about the nature of horror and terror: Why do these texts thrill readers? What is the nature of evil? Why is the alluring antagonist so appealing? How do texts reflect the cultural climate of their production? What is the psychology of characters and how does this link to human nature? How have writers presented the evil and grotesque and why are readers fascinated with "the abomination"? A range of authors will be studied such as The Graveyard Poets, Walpole, Radcliffe, Maturin, Poe, and both Stoker's and Polidori's vampire tales.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: The Graphic Narrative*

The Graphic Narrative semester seminar considers a burgeoning literary genre esteemed by modern scholars. Focusing on major representative texts that define and redefine the medium, students will learn how to approach the graphic narrative as a distinct literary and visual form. Through reading, writing and analyzing the written word and the visual depictions on the page, students will strengthen their visual literacy skills while building upon critical thinking and analytic skills. Students will become fluent in the language specific to "sequential art"; they will also quickly come to see that their literary analysis arsenal applies in every respect to graphic texts. Texts include Spiegelman's *Maus*, Satrapi's *Persopolis*, McCloud's *Understanding Comics*, and others.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Great Novels*

This course engages students in the critical reading of acclaimed novels by European, Asian and American writers. Through our encounters with works spanning the 18th through 21st centuries, we will trace the development of the novel as a genre and examine the social, psychological and ethical issues that interested their creators. Instructors choose from a rich bank of more than 30 texts by authors such as Jane Austen, Charlotte and Emily Brontë, Charles Dickens, Fyodor Dostoevsky, Ralph Ellison, E. M. Forster, Ernest Hemingway, Gabriel Garcia Márquez, Toni Morrison, V. S. Naipaul, Annie Proulx, Arundhati Roy, Jonathan Swift, Edith Wharton, Virginia Woolf and Charles Yu. Written assignments will be primarily analytical; however, the writing of personal responses will also be encouraged.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Jack Kerouac and the Beat Generation*

The literary movement known as the Beat Generation grew from feelings of disaffection and alienation amid the conformity in America during World War II and its aftermath. What began among a few friends whose interests ranged from jazz music to Buddhism evolved into the dominant voice of social protest during the Cold War era, opposing American materialism and imperialist practices, and advocating greater personal freedoms, acceptance of differences, pacifism and ecoconsciousness. In his writing Kerouac celebrated his own life, thoughts and spiritual search in a direct, frank, nontraditional style echoing jazz rhythms and the faster pace of modern society. The course will study the life and work of Kerouac in particular while also examining poems, essays and memoirs of numerous other Beat authors, particularly the poets Allen Ginsberg, Gary Snyder and Lawrence Ferlinghetti. Texts include the biography *Desolate Angel: Jack Kerouac, the Beat Generation*, and *America*, by Dennis McNally; *The Portable Beat Reader*, edited by Ann Charters; three Kerouac novels: *On the Road*, *The Dharma Bums*, *The Subterraneans*; and Ken Kesey's *One Flew over the Cuckoo's Nest*.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Justice in Literature*

If literature can be defined as the aesthetic expression in writing of human concerns, the human desire for justice has been, since the beginning, a principle theme. But what constitutes justice? As humankind evolves and cultural attitudes shift, so do notions of what is just and who should do the judging. Is justice merely a relative concept, defined by cultural mores, or are there absolutes? What is the relationship between individual freedoms and civilization's need to prescribe limits on behavior? And how should the individual and society react when justice is found to be imperfect or absent? The class will explore these and other issues while reading a variety of literary texts spanning from ancient Greece to contemporary America: Plato's *The Trial of Socrates*, Shakespeare's *The Merchant of Venice*, Melville's *Billy Budd*, Camus' *The Stranger*, *The Exonerated* by Jessica Blank and Erik Jensen, and *Zeitoun* by David Eggers.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Literature & the Environment*

This semester seminar introduces students to key ideas from the environmental humanities, an area of study that connects literature and culture with questions usually explored in science, like ecology, climate and sustainability. It brings together concepts from philosophy, history, geography, anthropology, and even political science to better understand how people imagine and respond to the natural world. We'll use these ideas to explore how American writers have portrayed nature as wilderness, a place of refuge, or even a ruined wasteland. Along the way, we'll read both classic and contemporary authors and watch films and documentaries that bring ecological thought to life. Primary readings include *The Overstory* by Richard

Powers, *Under the Feet of Jesus* by Helena María Viramontes, and *The Waste Land* by T.S. Eliot. Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Literature into Film*

This course explores the intersection of film and literature. As such, it first introduces two complementary disciplines: the study of film (its history, its techniques and its terminology) and the study of adaptation (its problems, its critics and its potential). With those foundations firmly established, the course turns to the relationship of selected novels and short stories to their cinematic counterparts, examining both the possibilities and the problems of reimagining a work and translating it from one medium to another. Students will develop their ability to analyze, to interpret, and to make sound arguments about literature, film and adaptation.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Literature of the Holocaust*

In this course, students examine a watershed event in human history in order to understand better the beliefs and attitudes which generate violence, bigotry, racism and eventually genocide and with which humans still contend in the 21st century. In addition to learning about the atrocities of which ordinary humans are capable, students will study examples of selflessness, courage and human decency, along with the social pressure to remain an indifferent bystander. While studying recent history, students will also consider the present-day challenge of creating a society in which human freedom and dignity are the prevailing norms. Course texts include Spiegelman's *Maus*, Wiesel's *Night Trilogy*, Levi's *Is This a Man*, Arendt's *Eichmann in Jerusalem*, and Kulka's *Landscapes of the Metropolis of Death*.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: The Inner Self: Literature's Psychological Depths*

The motif of mental instability recurs often in literary works because it raises important questions about the nature of the human mind and its creative processes:How do we delineate the difference between the sane and the insane? What is the correlation between madness and creativity? How does our cultural experience shape our perception of madness in human beings? The course will investigate madness in a variety of characters in world literature. Readings include *Medea*, *King Lear*, *The Yellow Wallpaper*, *Notes from the Underground*, *Long Day's Journey into Night*, Sylvia Plath's poetry and a more recent text, *Girl Interrupted*.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: The Bible as Literature*

This course uses the Bible (a literary tradition that straddles genres, languages, and vast expanses of time and space) to explore a variety of literary questions: What is authorship? How does a work exhibit unity? Do diverse genres complement one another or do they work at cross-purposes? By what process do works become accepted as "canon"? What is preserved and/or lost in translation? How does the meaning of a text shift depending on who we imagine as its author or as its intended audience? Reading focuses especially on 1) exposing students to the range of literary genres contained in the Bible (myth, genealogy, history, law, prophecy, biography, poetry, parable, argument, apocalypse, etc.), 2) representing the evolution of thought across Biblical texts, and 3) confronting the tension between unity and diversity among the Bible's parts. All work will be conducted in English.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: The Modern Essay*

This course teaches the craft of creative nonfiction through the lens of the modern prose essay, an expansive genre encompassing a broad variety of topics, rhetorical strategies and styles. By reading widely across this genre, students will learn 1) to recognize the tools that creative nonfiction writers employ to achieve their ends, and 2) to incorporate those tools into their own writing. Students will become familiar with the most popular subgenres of creative nonfiction, including memoir, profile, cultural criticism, argument and humor. Inspired by the many models on the syllabus, students will compose four or five nonfiction essays of different types, and they will revise and improve their work with the assistance of instructor feedback, peer revision and structured workshops.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Mystery and Detective Fiction*

This course explores the origins and development of the mystery/detective fiction genre, its generic conventions and its connection with shifting social ideology. How are detectives and criminals characterized? How does this representation change over time? What are the thought processes, methodology and psychology of the detective? How do crimes reflect the time period when the stories were written? This course investigates such questions by reading a range of texts including Sophocles' *Oedipus the King*, Agatha Christie's *And Then There Were None* and Raymond Chandler's *The Big Sleep*. There are also short stories by Poe, Melville, Conan Doyle (with his infamous Sherlock Holmes) and G. K. Chesterton.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Native American Literature

Native Americans have told stories – myths and legends, sacred and secular – for thousands of years, and in the last century their oral tradition has blossomed into literature that's beautiful and profound. The core texts, which include novels, short stories, nonfiction and poetry from different regions and time periods, all feature Native American voices and reflect the spirit and struggles of Indigenous people striving to survive and maintain their traditions. Texts include *American Myths and Legends*, *Fools Crow* by James Welch, *Love Medicine* by Louise Erdrich, *Lakota Woman* by Mary Crow Dog, *There There* by Tommy Orange, and anthologies of Native American short stories and poetry.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Postmodern Literature*

This course focuses on literary texts written since World War II which by nature of their subject matter, mood and narrative techniques are readily identified as postmodern. What is it about these works that distinguishes them from modernism? Most share the gloomy vision of society and human nature that emerged in the aftermath of World War I, but these later works contain a greater sense of absurdity, a playfulness of style, increased fragmentation – any number of techniques that serve to place them in this separate category, reflecting a significant cultural trend. Writers include Samuel Beckett, Kurt Vonnegut, Jr., John Barth, Donald Barthelme, Milan Kundera, Margaret Atwood and Don DeLillo. Students will become familiar with the full array of postmodern elements, learning to recognize them not only in our core texts but also in film and television, music, art, and architecture. They also will examine the relationship between postmodern literature and contemporary culture, observing how art can serve both as an emblem of and commentary on society.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Russian Literature*

This course uses the absurd – which Albert Camus called "the essential concept and the first truth" – as

the entry point for a survey of Russian literature. It will investigate the rich tradition of absurdist writing that emerged in Russia in the 19th century and persists into the present day, drawing on works by Nikolai Gogol, Lev Tolstoy, Fyodor Dostoevsky, Mikhail Bulgakov and Lyudmila Petrushevskaya. What historical and social contexts gave birth to that tradition? What functions does it perform? What truths can deliberately absurd tales – of a man's nose fleeing his face to climb the social ranks on its own, of a society so rigidly organized that even sexual encounters are dictated by the state, of the devil disguising himself as a professor of modern languages and taking up residence in Moscow with his 6-foot-tall black cat – teach us concerning conformity, society, politics, religion and power? All work will be completed in English.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Satire and Comedy*

A study of the theories and practice of satire and comedy is the focus of this class. Readings will range from works of the 16th century to contemporary authors. Works by writers such as Shakespeare, Behn, Twain, Burgess and Steve Martin form the core of the curriculum. Students will compare and contrast the works of these authors as they satirically present their perceptions of the world.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Shakespeare — Comedies, Tragedies, and Romances*

Shakespeare — Comedies, Tragedies, and Romances provides a comprehensive exploration of Shakespeare's plays as well as giving students a sense of life in Shakespearean England. Students gain a sense of the broad range of genres and themes that Shakespeare explored, and the ways he used race, class and gender to fuel his plays' central conflicts. The course also conveys a sense of Shakespeare's enduring appeal to a diverse audience, which at the time he wrote, represented all socioeconomic levels of Elizabethan society and included characters who represented kings and clowns, thwarted lovers, sharp-tongued heroines, and some of literature's most chilling villains.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Speculative Fiction and Society: Science Fiction and Fantasy*

As Ursula Le Guin says in her National Book Award acceptance speech, "The fantasist, whether he uses the ancient archetypes of myth and legend or the younger ones of science and technology, may be talking as seriously as any sociologist – and a good deal more directly – about human life as it is lived, as it might be lived, and as it ought to be lived." Students will explore speculative fiction not only as a genre, but also as a new way of perceiving established ideas about humanity, history and science. They will begin by examining the historical and theoretical underpinnings of speculative fiction and the ways this fiction has been used as a vehicle for commentary on contemporary society. In the process, the students will become familiar with the characteristic themes and styles employed by speculative fiction writers. By researching a work of speculative fiction, students will also reinforce their competence in selecting and evaluating sources, synthesizing the ideas of other scholars, and using the MLA style of documenting sources and integrating quotations and textual support into their papers. Works include short stories, novels and essays; authors may include Isaac Asimov, Margaret Atwood, Ted Chiang, Karen Joy Fowler, Robert Heinlein, Ursula Le Guin, George R. R. Martin, George Orwell, and H. G. Wells.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: A Study of Short Fiction*

This course will examine the origins of the modern short story while celebrating the diversity of the short story genre. With a large and eclectic group of writers to choose from, we will focus on key

elements of the genre, analyzing plot-driven narratives, the effective use of setting to convey meaning, character development, theme, the use of symbols, and point of view. This course stresses close critical reading and discussion of selected short stories, and we will read selections from such writers as Stephen Crane, Amy Hempel, William Faulkner, Raymond Carver, Ernest Hemingway, Anton Chekhov, Flannery O'Connor and James Baldwin, among others. Students will also examine critical theories and use those theoretical lenses to analyze the social, political and economic conditions inherent within the works. Students will keep journals and will produce one original work of short fiction over the course of the semester, along with several critical analysis papers. The course culminates in the Literary Journal Project in which students apply their skills in the analysis of contemporary short fiction.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Art of Poetry and Fiction*

This course, previously titled Creative Writing, is designed to give students an opportunity to analyze fiction and poetry written by both past and present masters of the craft, and then experiment with writing original fiction and poetry. The course will be divided into two phases. During the first phase students will study the models and techniques used by poets and fiction writers. By examining and discussing poetry from a technical point of view, students will gain an understanding of the language and forms of poetry, as well as imagery, figurative language, rhythm, tone and sound. In the study of short fiction, particular emphasis will be placed on elements of craft such as conflict, structure, character, tone, point of view and dialogue. During the second phase, students will have their writing discussed by the class in a workshop setting. After students generate ideas through reading and writing exercises, students will write their own fiction and poetry. During the workshop, students will gain experience in constructive criticism through individual conferences, written comments and peer reviews. Constant revision is required, so students should be prepared to receive criticism and use it to find their own voices as writers.

Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

English 4: Greek Myths: Ancient Texts, Modern Revisions

Greek mythology has served as a rich source of literary inspiration throughout the Western tradition to present day texts in English. This course examines how these myths continue to function as powerful narratives that both challenge and excite contemporary writers to reconceive them for modern readers. Students will examine myths as symbolic tales of the distant past that explain the origin and purpose of the natural world, as well as cycles of birth and death, and the hero/heroine's journey. Beginning with creation stories from around the world, the course focuses primarily on Greek classical materials from Hesiod's Theogony, Euripides' Medea, and Homer's Odyssey and Iliad and then examines later reconceptions of the stories in Ovid's Metamorphoses and in more recent novels, Mary Renault's The King Must Die and Madeline Miller's Circe. The course also poses these literary and cultural questions: How does the meaning of myth change depending on who we imagine as its primary protagonists and antagonists as well as its intended audience? How do these myths resonate with different cultural moments? Why do modern authors continue to reshape them for our own time in forms both popular and literary? How do Greek myths relate to creation and other myths from cultures around the world?*
Prerequisite: English 3, Honors English 3 or departmental approval. UC approved.

History and Social Science

The history department introduces students to the disciplines of history and the social sciences. We cover not only the facts and figures of history but also the great concepts, controversies, perceptions and philosophies of the past. In doing so, we hope that Harker students will become knowledgeable, ethical and responsible citizens.

REQUIRED COURSES
In grade 9, students satisfy their history requirement by taking either World History 1 or Honors World History 1.

World History 1: Early Civilizations through the Renaissance

This course provides students with an overview of world history from early river valley civilizations through the early modern era (5000 B.C.E –1600 C.E.). Students will study all the principal political, social, economic, religious and intellectual developments of Europe, Africa, Asia and the Americas. All the major world religions are introduced and students will leave with an understanding of the world as an interconnected, dynamic, global society. Skills such as document evaluation, thesis construction, essay writing and the research process are introduced and practiced.

Prerequisite: None. UC approved.

Honors World History 1

This course provides a substantive introduction to world history from early river valley civilizations circa through the early modern era (circa 5,000 B.C.E. - 1600 C.E.) The course emphasizes a global and cross-cultural approach to the understanding of the evolution of human societies in the Near East, China, Africa, India, the Middle East, the Americas, the Mongols and Europe with a particular emphasis on the study of world religions, political and economic systems, social orders and cultural practices. Knowledge of the research process, the use of primary source documents, essay writing and a comparative and analytical approach to history are emphasized. The course is designed to prepare students for higher level history and social science courses.

Prerequisite: None. UC approved.

In grade 10, students satisfy their history requirement by taking World History 2, Honors World History 2, AP World History or AP European History.

World History 2

In this yearlong course, the period from the Scientific Revolution to the turn of the new century is studied (1600-2000 C.E.). The first semester focuses on Europe, and the second semester devotes one month each to Asia, South Asia, Africa and the Middle East. Political, economic, intellectual, social and artistic movements and ideas are studied. These include, but are not limited to, mercantilism and free market capitalism, political theory and governments from absolutism, to representative democracies, the Agricultural and Industrial Revolutions, imperialism, nationalism, militarism and socialism. Skills such as document evaluation, essay writing and the research process are practiced and emphasized.

Prerequisite: Completion of grade 9 history requirement. UC approved.

Honors World History 2

This yearlong, honors-level course will offer students the opportunity for in-depth study of the

modern era from 1450-1980 in four regions of the world; Europe, Latin America, East and Southeast Asia, and South Asia. Emphasis will be placed on using and interpreting primary and secondary sources to gain a deeper understanding of the social, intellectual, political, economic and cultural history in these regions. Students will be expected to keep abreast of current events and to be able to relate those events to the history of the region. Additionally, students will engage in cross-regional comparative analysis and research projects allowing individualized exploration. Note: This course will not prepare students for the AP exam in either World History or European History.

Prerequisite: Completion of grade 9 history requirement and departmental approval.

AP World History: Modern

Intended to prepare students for the AP examination, students study the history of Asia, the Americas, Europe and Africa utilizing a thematic approach that covers change and continuity over time. Interaction among societies and regions; the impact of technology's demographics and economics on both people and the environment; social structures in differing societies; political structures and organizations; and religious, cultural and intellectual developments are studied. The mastery of content material, analytical essay writing, the evaluation of primary source documents and historical research are also emphasized.

Prerequisite: Completion of grade 9 history requirement and departmental approval. UC approved.

AP European History

Intended to prepare students for the AP examination, the course requires a depth and breadth of study designed to challenge students. The course material spans the time period from 1400 to the present in all parts of Continental Europe and Great Britain with careful examination of major political, social, economic, intellectual and religious trends. In addition to the discussion of content material, the mastery of analytical essay writing, the evaluation of primary source documents, historical research and daily student participation are emphasized.

Prerequisite: Completion of grade 9 history requirement and departmental approval. UC approved.

In grade 11, students satisfy their history requirement by taking U.S. History, Honors U.S. History or AP U.S. History.

United States History

This yearlong course is a topical survey of the history and culture of the United States from the colonial era to the present. Topics include the interaction of Native American, European and African populations, the Constitution and Bill of Rights, the impact of the Industrial Revolution, the Depression and the impact of World War II. Themes pertaining to current history include the civil rights movement, the turmoil of the 1960s, the crises of Vietnam and Watergate, and East-West relations. Economic developments, political and religious trends and social history are all covered. In addition to the discussion of content material, analytical essay writing, the evaluation of primary source documents, historical research and daily student participation are required.

Prerequisite: Completion of grade 10 history requirement. UC approved.

Honors United States History

This yearlong course is a survey of United States history from the pre-Columbian period to the present, with emphasis on the in-depth study of movements in the 20th and 21st centuries. Students will use and interpret advanced primary and secondary sources to gain a deeper understanding of political, economic, social, intellectual and cultural history, and to develop analytical arguments by selecting and using applicable historical evidence to support claims. The course will also include regular research projects and presentations, including a long-form

written research paper. Note: This course will not prepare students for the AP exam in U.S. History.

Prerequisite: Completion of grade 10 history requirement and department approval. UC approved.

AP United States History

Intended to prepare students for the AP examination, this course requires a depth and breadth of study designed to challenge students. In AP U.S. History, each of the topics in the regular course is studied with a greater intensity, as the roots and impact of major social, political and economic trends are more closely examined. In addition to the discussion of content material, the mastery of analytical essay writing, the evaluation of primary source documents, historical research and daily student participation are emphasized.

Prerequisite: Completion of grade 10 history requirement and department approval. UC approved.

YEARLONG HISTORY ELECTIVES

Harker history department offers six yearlong history electives. We offer the aforementioned Honors World History 2, AP European History and AP World History that students may take in grade 11 or grade 12 if they qualify and have not already taken in grade 10. We also offer the following courses:

AP African American Studies

Intended to prepare students for the AP examination, students will study the diversity of African American experiences. Students will explore key topics that extend from early African kingdoms to the ongoing challenges and achievements of the contemporary moment. Given the interdisciplinary character of African American Studies, students in the course will develop skills across multiple fields, with an emphasis on developing historical, literary, visual and data analysis skills. This course foregrounds a study of the diversity of Black communities in the United States within the broader context of Africa and the African diaspora.

Prerequisite: Completion of grade 10 history requirement. UC approved.

AP Art History

Intended to prepare students for the AP examination in art history, the course is a survey of world art from pre-history to the present with a strong emphasis on Western art. Students will develop a vocabulary while studying all major forms of artistic expression including painting, sculpture and architecture within diverse historical and cultural contexts. Image identification, critical analysis and evaluation of both context and aesthetics are emphasized.

Prerequisite: World History 1 or Honors World History 1 and departmental approval. UC approved.

AP Psychology

Intended to prepare students for the AP Psychology exam, this course introduces students to the systematic and scientific study of the behavior and mental processes of human beings. Students become familiar with the various branches of psychology and the methodologies used by psychologists. Physiological, psychodynamic and behavioral schools of thought are all addressed. Key topics include personality theory, developmental psychology, psycho-pathology and treatment, theories of motivation, emotion and learning, and social psychology. Students are evaluated on a variety of assignments including projects, quizzes and tests and are introduced to psychological research.

Prerequisite: Open to grade 12 students who have completed one of the following: 1) AP or Honors U.S. History with departmental approval; 2) U.S. History with an A; or 3) U.S. History with an A- and who are approved for an honors or AP science course in grade 12. UC approved.

AP United States Government and Politics

Intended to prepare students for the AP examination in United States government and politics, this course examines the foundations of our political institutions and how these systems function. Students study the role of political parties, special interest groups, the media and individuals within the development of public policy and also examine recent Supreme Court rulings and their impact on civil rights and liberties within our country. The course will provide students with analytical perspectives on our government and political system.

Prerequisite: Completion of grade 11 history requirement and departmental approval. UC approved.

SEMESTER HISTORY ELECTIVES

Civics and Regional Politics*

This semester-long elective course will introduce students to various concepts of the study of American government and democracy that will ultimately enable them to participate effectively in civic life in America. This course will uniquely look at local and state government in California as a significant subject of coverage, with a more generalized overview of national government. This course is designed to give students an analytical perspective of civics and government in the United States by including both the study of general concepts used to interpret civics and government as well detailed analysis of specific current political issues. Throughout the class, students will develop a familiarity with government institutions, as well as political groups, beliefs and ideas with a focus on civic engagement at the local, state and national levels.

Prerequisite: Completion of grade 9 history requirement. UC approved.

History of the Holocaust and Genocide*

This course is a semester-long, in-depth study of the causes, course and consequences of the Holocaust from a variety of perspectives. From this study, students will gain an understanding of the framework and themes that will be repeated in acts of genocide in other countries and will use that knowledge to conduct individual research on other genocides including in the Congo, Armenia, Cambodia, Rwanda, Guatemala, Native America, Bosnia and Darfur.

Prerequisites: Completion of grade 10 history requirement and department approval. UC approved.

Honors Modern International Affairs*

The course (formerly International Issues & Public Policy) follows two tracks with the purpose of preparing students to excel in critical thinking and research. The first track is a seminar-style discourse on current events. Due to the variability of modern international affairs, the curriculum will change to cover international issues as they occur. In order to build skills to understand complicated international events students will be instructed in media literacy. Students will also use international news sources to examine events with diverse critical tools ranging from scholarly journals to books. The second track of the class works on developing research skills in order to write a college-level term paper. Students will choose their own international issues and write a policy analysis and proposal on that topic. During the semester, students will be instructed on research strategies and build skills to best leverage diverse resources. The end result of this track is a deeply researched original piece of scholarship. This class prepares students for the expectations of a seminar style class in college in addition to providing students with the experience of writing a college-level term paper.

Prerequisite: Completion of grade 11 history requirement and departmental approval. UC approved.

Introduction to Ethnic Studies*

As the United States has been and continues to be an ethnically diverse country, an understanding of various groups' experiences and contributions is fundamental to understanding American culture. Ethnic Studies will examine methods for learning and studying ethnic groups and will then put those methods into practice with introductory studies of Asian American, African American and Latinx experiences, though other groups may be substituted or added as need and interests suggest. Students will develop an understanding of what it means to "center" a particular identity's experience when exploring that identity's history. Students should be prepared for a combination of lecture, projects and seminar-style instruction in which their active participation will be vital. Course materials will include scholarly journals, books, documentary film and popular media.

Prerequisite: Completion of grade 9 history requirement. UC approved.

Introduction to Women and Gender Studies*

Introduction to Women and Gender Studies explores critical questions about the meaning of gender in society. We will familiarize students with key issues, questions and debates in women's studies scholarship, both historical and contemporary. Anchored in seminar-style discussion and student-led discourse, we will examine many of the critical questions and concepts feminist scholars have developed as tools for thinking about gendered experience. In addition, we will explore the complex ways in which gender intersects with class, race, ethnicity, sexuality and age within various spheres and institutions of society. Themes of gendered performance and power in a range of social spheres, such as law, culture, education, work, social policy and the family will be discussed and studied. Course materials will include scholarly journals, books, podcasts, videos and popular media.

Prerequisite: Completion of grade 9 history requirement. UC approval in process.

Introduction to Social Justice: Methods and History*

This course will explore the theories of social justice and case studies of social justice in action. The class will begin by exploring varied definitions and uses of the term social justice and social justice methodology. We will then look at real world examples of social justice movements possibly including, but not limited to, the Black Civil Rights Movement in the late 20th century, post-Stonewall LGBTQ efforts, women's rights movements, Free Tibet, anti-apartheid in South Africa and around the world, anti-war movements of the last 120 years and the Justice for Vincent Chin movement. Finally, we will evaluate the state of evolving social justice movements in the modern media landscape. Students should be prepared for a combination of lecture, projects and seminar-style instruction in which their active participation will be vital. Course materials will include scholarly journals, books, documentary film and popular media.

Prerequisite: Completion of grade 9 history requirement. UC approved.

Latin American History*

This course examines the historical trajectory of Latin America's development, starting with European colonization, and continuing to the eras of revolution and dictatorship that followed from independence and the forging of new nations. Concentrating on political, economic, social and cultural themes, the course utilizes a variety of primary and secondary sources, including poetry, music, novels and film. Classwork encompasses active participation, response papers, document-based essays, a weekly news journal and a final written project, including an in-class presentation, on a topic of particular interest to the student.

Prerequisite: Completion of grade 9 history requirement. Concurrent enrollment in AP U.S. History recommended. UC approved.

Psychology*

This course is a semester-long, introductory-level course in psychology. Students will explore in some depth the subdisciplines of personality and development theory, states of consciousness, abnormal psychology and therapy, learning, memory and human behavior. Evaluation will include projects, presentations, quizzes and tests.

Prerequisite: Completion of grade 9 history requirement. UC approved.

Social Psychology*

Social psychology is the study of how an individual's thoughts, feelings and behavior influences are influenced by the thoughts, feelings and behavior of others. In other words, it is the study of how people operate interpersonally and in groups. This course is an introductory survey of the major topics and ideas in social psychology. Topics will include self-perception, attitudes and persuasion, stereotypes, prejudice and discrimination, aggression, altruism, compliance, conformity and obedience, gender, culture and attraction. Students will seek to understand scientific principles of social psychology and apply them to study real-world problems through accessing scholarly research, interpreting media coverage of said research, and understanding how coverage of current events and solutions can be influenced by psychological research. Projects and assessments in the course will require students to interpret current issues and events in light of social psychological research.

Prerequisite: Completion of grade 9 history requirement. UC approved.

World Religions and Philosophy*

The purpose of this course is to introduce students to the five major world religions (Hinduism, Buddhism, Judaism, Christianity and Islam), along with other religious traditions such as Shamanism, Mysticism, Taoism, Confucianism and modern religious sects. Students will develop an appreciation for the cultural impact of those faiths on their respective societies.

Prerequisite: Completion of grade 9 history requirement. UC approved.

Journalism

Journalism teaches students to share stories about their community through a variety of written, visual and auditory forms. Students learn to cover campus events, interview students and faculty, and develop their voice through writing. With access to cutting-edge equipment and software, they explore photojournalism, editing and advanced design. Students will be able to have their work published for the newspaper Winged Post, online at Harker Aquila, senior feature magazine Humans of Harker and yearbook TALON.

Introduction to Journalism (1 year/0.5 unit)

Introduction to Journalism is a full-year course that introduces students to what it means to be a successful journalist. The goals of this course are fourfold: 1) understand how news is reported, written and conveyed; 2) study the history of journalism, ethics and professional standards that guide journalists; 3) learn to interview, report, research; 4) use media tools for content coverage and creation (professional camera equipment, video editing, design software). Introduction to Journalism is the prerequisite for joining the official staff of Journalism: News and Journalism: Yearbook. Because this is an Extra Period Option course, students may take this course in addition to their full academic loads. The course carries one-half credit for a full year of participation.

Prerequisite: None.

Journalism: Yearbook (1 year/0.5 unit)

Journalism: Yearbook students are responsible for the writing, editing and photography of the pages for our yearbook, TALON. The emphasis of this course is the achievement of higher-level communication skills and proficiency in print publishing. Students learn a variety of writing styles and current design trends. They will learn how to use the latest in design software. Because this is an Extra Period Option course, students may take this course in addition to their full academic loads. The course carries one-half credit for a full year of participation.

Prerequisite: Completion of Introduction to Journalism.

Advanced Journalism: Yearbook (1 year/0.5 unit)

This course is an extension of the Journalism: Yearbook course and welcomes a deeper engagement of feature journalism and opportunities for leadership. The emphasis of this course is mastery of their skills in design, photography, editing and writing. Because this is an Extra Period Option course, students may take this course in addition to their full academic loads. The course carries one-half credit for a full year of participation.

Prerequisite: Completion of one year on Yearbook staff.

Journalism: News (1 year/0.5 unit)

Journalism: News students are responsible for writing, photographing and designing articles for Harker's news publications. The emphasis of this course is the achievement of higher-level communication skills and proficiency in online media and print publishing. Students learn a variety of writing styles and current design trends. They will learn how to use the latest in print, video and audio software. Because this is an Extra Period Option course, students may take this course in addition to their full academic loads. The course carries one-half credit for a full year of participation.

Prerequisite: Completion of Introduction to Journalism.

Advanced Journalism: News (1 year/0.5 unit)

This course is an extension of the Journalism: News class and welcomes a deeper engagement of news journalism and opportunities for leadership. The emphasis of this course is mastery of their skills in design, photography, editing and writing.

Because this is an Extra Period Option course, students may take this course in addition to their full academic loads. The course carries one-half credit for a full year of participation.

Prerequisite: Completion of one year on the News staff.

Mathematics

Classes within the mathematics department are designed to broaden the mathematical knowledge and skills of our students. With offerings from algebra to AP Calculus and beyond, students are taught to master the fundamental processes while their problem-solving abilities are challenged with increasingly complex material. Placement is determined by the needs and talents of each individual. Students supplement their information resources with the required use of a graphing calculator and/or a laptop computer. Three years of study are required of all, though students are strongly encouraged to complete a four-year program.

Algebra 1

This is a one-year course with some discussion of theory and application beyond basic manipulative skills. Topics include simplifying expressions, solving and graphing equations and inequalities, factoring polynomials, simplifying rational expressions, solving systems of equations and simplifying radicals. The course concludes with the quadratic formula. A scientific calculator is required; a graphing calculator is recommended.

Prerequisite: None. UC approved.

Geometry Foundations

This yearlong Geometry course emphasizes both inductive and deductive reasoning, strengthening students' logical thinking and visual-spatial skills through hands-on exploration and formal proof. Students will investigate geometric relationships, construct figures using compass and straightedge, and use online tools for dynamic visualization. Through guided discovery, students develop basic proof-writing skills and uncover foundational theorems. Topics include the properties of triangles, polygons, circles, polyhedra, and an introduction to trigonometry.

Geometry

This comprehensive two-semester, Euclidean-based geometry course emphasizes and integrates both inductive and deductive reasoning as well as visual-spatial skills. Congruence, similarity, parallelism, perpendicularity and properties of the Euclidean plane are integrated in a continual development and practice of mathematical reasoning. A balanced treatment of theory and application, as well as formal and informal reasoning as demonstrated through written proofs and problem-solving are an integral part of the course work. Students discover new theorems and explore transformations using the Desmos online tool. Once a new theorem is accepted and internalized, students are guided through the formal mathematical proofs of these new conjectures. A scientific calculator is required; a graphing calculator is recommended.

Prerequisite: Algebra 1. UC approved.

Honors Geometry

Areas of study include those listed for the Geometry course. In addition, this course places a greater emphasis on mathematical proof, construction, creativity and transformations. Students discover new theorems and explore transformations using Geometer’s Sketchpad® dynamic software environment. Students are encouraged to explore challenging problems and stretch their sense of mathematics throughout the course. A graphing calculator is required.

Prerequisite: Algebra 1 and departmental approval. UC approved.

Algebra 2 Foundations

This one-year course reviews and builds upon concepts introduced in Algebra 1. Students study expressions, functions, equations, and inequalities

algebraically, numerically, and graphically. Throughout the year, students will strengthen their ability to do mathematical analysis and real-world applications by hand and also with the aid of a graphing calculator. Specific types of functions covered in this course are absolute value functions, linear functions, polynomial functions, radical functions, rational functions, and exponential and logarithmic functions. In addition, students will study properties of radicals and complex numbers. A graphing calculator is required.

Prerequisite: Geometry. UC approval in progress.

Algebra 2 & Trigonometry

This course builds upon the concepts introduced in Algebra 1. Students will study functions, relations, expressions and equations algebraically, numerically and graphically. Specific types of functions include: absolute value functions, polynomial functions, rational functions, and exponential and logarithmic functions. In addition, students will learn about radicals and complex numbers. The course concludes with an introduction to trigonometric functions and graphs, including problem-solving with oblique triangles. A graphing calculator is required.

Prerequisite: Geometry. UC approved.

Honors Algebra 2 & Trigonometry

Areas of study include those listed for the Algebra 2 course. In addition, this course places a greater emphasis on graphing, mathematical proof, exploration of variation, analytic geometry and trigonometric relationships. A graphing calculator is required.

Prerequisite: Geometry and departmental approval. UC approved.

Precalculus Foundations

In order to strengthen advanced mathematical reasoning skills by building on the Algebra 2 foundations, students take a deeper dive into functions, exponentials, logarithms and sequences/series at an intentional pace. Semester 2 includes a lengthy exploration of trigonometry to complete students' preparation for a future introduction to calculus. Additionally, semester 2 introduces topics used in other quantitative disciplines including finance and personal investing. students also examine combinatorics, probability, and statistics to better prepare for future courses in statistics, business, or economics. Each semester concludes with a project encompassing examined topics. A graphing calculator is required.

Prerequisite: Algebra 2 & Trigonometry. Not available to grade 9 students. UC approved.

Precalculus

This course provides a thorough study of relations, functions and problem-solving through algebraic, numerical and graphical techniques. The topics covered in this course are polynomial, rational, exponential, logarithmic and trigonometric functions. Applications of the topics, such as trigonometric identities, conic sections, sequences and series are explored. The course concludes with an introduction to limits. A graphing calculator is required.

Prerequisite: Algebra 2 & Trigonometry and Geometry. Not available to grade 9 students. UC approved.

Honors Precalculus

This rigorous course provides a much deeper exploration of the precalculus curriculum. The areas of study include the topics covered in Precalculus and extend to cover vector operations and complex number operations in trigonometric form. In addition, polar and parametric equations, advanced matrix operations, and probability and statistics are explored. The course will conclude with an introduction to calculus. A graphing calculator and Mathematica are required.
Prerequisite: Algebra 2 & Trigonometry, Geometry and departmental approval. UC approved.

Calculus

This Calculus course is an excellent alternative to AP Calculus AB, especially for students whose interests lie outside of pure math or the science fields. Topics include the calculus of rational, exponential and logarithmic functions including limits, derivatives, antiderivatives and definite integrals. Students will view problems graphically, numerically and algebraically, focusing on applications of derivatives and definite integrals. Mathematica will be used throughout the course to enhance the learning and understanding of the various topics. A graphing calculator is required.

Prerequisite: Precalculus. Open to students in grades 11 and 12. UC approved.

Statistics

Statistics is a one-year course designed as an introduction to applied statistics. This course is primarily intended to outline the basic methods of analysis and interpretation of data. Topics covered in the course include descriptive statistics, various sampling methods, probability, estimation and hypotheses testing. This course will provide preliminary experiences for the tools required for psychology, social and life sciences. Students in this course will use a graphing calculator, web-based java applets, and simulations to explore statistical concepts and skills.

Prerequisite: Precalculus and departmental approval. Grade 12 students only. UC approved.

AP Calculus AB

This college-level course covers the calculus of functions of one variable. The appropriate use of technology will be integrated into the course through the use of graphing calculators. Ideas are explored graphically, symbolically and conceptually, with an emphasis on correct mathematical argumentation. Topics covered include limits, continuity, derivatives, antiderivatives, techniques and applications of differentiation and integration, the fundamental theorem of calculus, separable differential equations and slope fields.

Prerequisite: A- or better in Precalculus, Honors Precalculus and departmental approval. Not available to grade 9 students. UC approved.

Honors Calculus C with Multivariable Calculus

This yearlong college-level course is designed for students who have successfully completed Calculus AB. In the first semester students will complete the Advanced Placement Calculus BC curriculum, including advanced integration techniques, calculus of polar and parametric functions, Euler's method and Taylor series. During the second semester students will complete the same topics as Honors Multivariable Calculus up through multiple integrals. Students will be prepared for the BC Advanced Placement exam in May. Calculus AB and C cover in two years what Calculus BC and Multivariable Calculus cover in three semesters. A graphing calculator and Mathematica are required.

Prerequisite: AP Calculus AB and departmental approval. A 4 or 5 on the AP Calculus AB exam is recommended. Grades 11-12 students only. UC approved.

AP Calculus BC

This intensive and fast-paced course is a rigorous study of single-variable calculus. Topics include all those listed under Calculus AB plus polar and parametric functions, Euler's method, polynomial approximations and Taylor Series. A graphing calculator and Mathematica are required.

Prerequisite: A- or better in Honors Precalculus and departmental approval. UC approved.

AP Statistics

AP Statistics is the high school equivalent of a one-semester, introductory college statistics course. In this course, students develop strategies for collecting, organizing, analyzing and drawing conclusions from data. Students design, administer and tabulate results from surveys and experiments.

Probability and simulations aid in constructing models for chance phenomena. Sampling distributions provide the logical structure for confidence intervals and hypothesis tests. Students use a graphing calculator, Fathom statistical software and web-based java applets and activities to investigate statistical concepts. To develop effective statistical communication skills, students are required to prepare frequent written and oral analyses of real data.

Prerequisite: Precalculus. Grade 12 students only. UC approved.

POST-AP SEMESTER COURSES

Honors Multivariable Calculus*

This one-semester course studies the calculus of functions of several variables. Topics include vector functions and motions in space, partial differentiation, multiple integrals, line integrals, Green's Theorem, and Stokes' Theorem. A graphing calculator and Mathematica are required.

Prerequisite: AP Calculus BC and departmental approval. Grades 10 – 12 students only. UC approved.

Honors Differential Equations*

This course will focus on the theory and techniques for finding solutions to ordinary, first-, second- and higher-order linear differential equations. In addition, students will be introduced to Laplace transforms and ideal functions. Mathematica and a graphing calculator are required.

Prerequisite: AP Calculus BC or Honors Calculus C and departmental approval. Grades 10 – 12 students only. UC approved.

Honors Linear Algebra*

This one-semester course will introduce students to advanced matrix algebra. Topics include Gaussian elimination, matrix operations, eigenvalues and eigenvectors. A graphing calculator and Mathematica are required.

Prerequisite: AP Calculus BC or Honors Calculus C and departmental approval. Grade 11-12 students only. Grade 12 students may request to take Linear Algebra concurrently with AP Calculus BC in the spring. UC approved.

Honors Discrete Mathematics*

This one-semester course gives students an introduction to many mathematical areas of the 36 non-continuous type. Specific topics to be covered include: logic; proof by induction; discrete calculus; voting methods and Arrow's Impossibility Theorem; weighted voting and power indexes; fair division games; Euler and Hamilton paths/circuits and useful algorithms; graphs, networks and trees; critical paths for scheduling; Fibonacci numbers; fractals. Coding in Mathematica will be required to facilitate deeper understanding.

Prerequisite: AP Calculus BC or Honors Calculus C and departmental approval. Grade 11-12 students only. Grade 12 students may request to take Discrete Math concurrently with AP Calculus BC in the spring. UC approved.

ADVANCED TOPICS COURSES

Honors Advanced Topics Math: Information Theory 1*

Information Theory Part 1 is the first part of a two-part offering that explores the basic concepts of information theory, as initially described by Claude Elwood Shannon at Bell Labs in 1948. Information theorists have created a rich mathematical framework that addresses fundamental questions, such as: What exactly is information and how is it measured? How can we communicate it reliably and efficiently across distances? Are there any fundamental limits to communication? The course will explore all these questions. Topics covered include: source characterization, compression problems, common codes, entropy, source coding theorem; channel characterization, coding problems, Hamming and Reed-Solomon codes, channel capacity, channel coding theorem; Shannon's Theorem; and student projects on the

state-of-art in compression algorithms and coding algorithms.

Prerequisite: One year of post-AP Calculus math courses. UC approved.

Honors Advanced Topics Math: Information Theory II*

Information Theory Part 2 is the second part of a two-part offering that explores information theory, as initially described by Claude Elwood Shannon at Bell Labs in 1948. In the course, students will explore other applications related to the disciplines of gambling, statistics, physics, computer science, economics and philosophy. The course concludes with a student project that either develops further one of the above applications, or explores a new application of information theory.

Prerequisite: Honors Advanced Topics in Math: Information Theory I. UC approved.

Honors Advanced Topics Math: Differential Equations II*

Students in this college-level course will study first-order and higher-order linear, differential equations and Laplace transforms. Other topics include linear systems of differential equations, nonlinear systems, chaos, eigenvalues and boundary value problems. Students will use Mathematica extensively.

Prerequisite: Honors Differential Equations and department approval. UC approved.

Honors Advanced Topics Math: Probability & Stochastic Processes*

This course provides a solid foundation to probability theory and its applications.

On the theoretical side, we will cover random variables (both discrete and continuous), their distributions, and expectation and variance. We then generalize from random variables to random vectors, and finally to random "signals" (i.e., functions). Random signals are also known as stochastic processes and represent a rich and fascinating area of modern mathematics. This area includes discrete-time IID processes, continuous-time Renewal processes, discrete-time Markov processes, continuous-time Markov processes, and continuous-time Brownian motion.

On the application side, there are of course the classic applications to insurance and to manufacturing quality and reliability. But the past two decades have seen a rapid proliferation of new applications, owing to availability of vastly greater computational power, and it is to these modern applications that we'd like to expose the student. Examples are the PageRank algorithm underlying Google's search engine, the Black-Scholes model underlying financial options and derivatives, and, most recently, LLMs like ChatGPT.

This mixture of theory and applications will make the course accessible yet challenging. The intended audience is mathematically mature high school students interested in pursuing engineering, data science or finance.

Prerequisite: One year of post-AP Calculus math courses. UC approved.

NON-MATH ELECTIVE

Engineering*

This one-semester course introduces a variety of topics within engineering including the design process, energy and power, statics/mechanics and economics (project analysis). Quantitative analysis will be used to support all claims. One goal of this course is to give students an introduction to engineering to help them decide if engineering (and maybe even a specific field within engineering) might be pursued at the university level. Prerequisite: Precalculus. Grade 12 students only. UC approved but as an elective course, not as a math course.

Modern and Classical Languages

Courses in the modern foreign languages develop all the basic skills – listening, speaking, reading, writing and punctuation. They provide students with an understanding and appreciation of a culture other than their own. The language being studied is used in the classroom from the onset. Students acquire a working knowledge of essential grammatical structures and learn to speak and understand the language. Accurate and effective writing is a major goal, and serious full-length works are read beginning in the third year. Entering students may wish to continue studying a language begun at their previous schools. Placement will be determined by a test. Other students may begin a new language at this point in their education. To meet graduation requirements, students must complete the study of one language through the third-year course. However, students with diagnosed learning differences in an area that affects language acquisition are eligible for a level 3 language exemption. This is reviewed on a case-by-case basis with a process that begins by contacting our learning specialist.

Spanish 1

Students with little or no previous exposure to Spanish are introduced to the basic elements of the language and to the cultures of the Spanish-speaking world. Emphasis is on basic language skills: listening, speaking, reading and writing. The ability to communicate in simple written and spoken Spanish is promoted through a variety of materials and activities.

Prerequisite: None. UC approved.

Spanish 2

Students continue to study grammar and vocabulary, and emphasis is placed on written and oral expression using correct sentence structure. A study of the culture continues while students build the four language skills: listening, speaking, reading and writing.

Prerequisite: Spanish 1. UC approved.

Honors Spanish 2

This course is an accelerated continuation of the first year of Spanish. It is designed to build at a quick pace and in greater depth on the vocabulary and concepts introduced in beginning Spanish courses. After the first day, the entire course is conducted in Spanish. Students will cultivate their speaking, listening, reading and writing skills. The course prepares students for Honors Spanish 3.

Prerequisite: Spanish 1 and departmental approval. UC approved.

Spanish 3

Spanish 3 is an intermediate level Spanish course designed to consolidate the concepts introduced in Spanish 1 and 2. Our theme-based curriculum offers students meaningful contexts to increase their Spanish vocabulary and to develop more complex grammar. Constant interaction in the target language and opportunities to write about topics of interest to teenagers help our students communicate more effectively in various time frames (present, past and future). Students learn about cultural elements of the Spanish-speaking world through the readings, songs, television programs, video clips and films analyzed in class. They also do formal oral presentations related to products, practices and perspectives in Spanish-speaking cultures.

Prerequisite: Spanish 2. UC approved.

Honors Spanish 3

Honors Spanish 3 is an accelerated intermediate-level course designed to help students

to acquire a greater proficiency in the language at a pace that is appropriate to their ability. Students who reach this level have the necessary linguistic resources to understand spoken Spanish at a normal pace, as well as to communicate with others with a degree of fluency, accuracy and spontaneity that enable regular interactions with native speakers. Students deliver organized presentations on subjects that might require research in addition to writing on general-interest topics, events and experiences with various time references. They understand the main idea and most supporting details in stories and descriptions presented in a variety of genres. Students explore various aspects of Hispanic history and culture. Finally, this course prepares students to take the AP Spanish Language and Culture course the following year.

Prerequisite: Honors Spanish 2. UC approved.

Spanish 4

This is an intermediate/advanced Spanish course designed to help students develop further their previously acquired skills in Spanish. While students continue to review grammar, they move to a more advanced level of the language-learning process. They read, write and discuss more, and do frequent oral presentations. They implement the grammar reviewed throughout the course to discuss the history, culture, art and literature of the Spanish-speaking world. Students will research and make presentations about specific historical, literary and cultural topics using the internet. The entire course is conducted in Spanish, and there are both written and oral evaluations.

Prerequisite: Spanish 3. UC approved.

Honors Spanish 4

This is an accelerated Spanish course designed to strengthen further the language skills acquired through the intermediate levels of Spanish. All four language skills (speaking, writing, reading and listening) are rigorously trained through a full range of engaging and interactive activities. Basic grammar is reviewed to a degree, but there is a special emphasis on the more complex structures of the language. The development of topic vocabulary continues, but the course also ushers students into a more expansive acquisition of idiomatic expressions. Moreover, the course has a clearly defined cultural component, with an eye toward the AP Spanish Language and Culture course. Students study a good selection of cultural readings and do written and oral cultural comparisons in which they juxtapose particular cultural products, perspectives and practices of the Spanish-speaking world with those of the U.S. The course is conducted entirely in Spanish, and students are required to communicate in the target language exclusively. Spanish 4 Honors serves as a pre-AP course for qualified students from the Spanish 3 regular course or any Spanish 3 honors students needing an additional year of linguistic fortification.

Prerequisite: Honors Spanish 3 or Spanish 3 with departmental approval. UC approved.

AP Spanish Language and Culture

This course is the standard AP Spanish Language course. Adhering to AP guidelines and through a variety of engaging and interactive methods, it focuses on the continued cultivation of students' language skills as well as a rich exploration of Spanish and Latin American culture. Students are expected to take the AP Spanish Language and Culture examination in the spring.

Prerequisite: Honors Spanish 3 or Honors Spanish 4. UC approved.

AP Spanish Literature and Culture

This course is designed for students with advanced proficiency and interest in the language. They are exposed to a wide variety of genres and types of discourse, which will enable them to trace the history of Spanish prose, poetry and drama through some of its most important authors. The reading list is also intended to acquaint students with significant works that are considered masterpieces of world literature. Students are expected to take the AP Spanish Literature and Culture examination in the spring.

Prerequisite: AP Spanish Language. UC approved.

Honors Advanced Topics in Spanish: Literature and Film of the Spanish-Speaking World*

This course is offered to students seeking to maintain and further develop their Spanish-language proficiency while delving into examples of quality literature and their corresponding cinematographic versions. Students will also view two to three Spanish or Latin American films independently and do presentations on these films following the guidelines given by the instructor. Conducted entirely in Spanish, the course is primarily discussion-based, but students will also act out scenes, participate in debates related to the works, and write analytical essays and creative pieces.

Prerequisite: Honors Spanish 4 or AP Spanish Language and Culture. UC approved.

Honors Advanced Topics in Spanish: The Latin American Short Story*

This course undergoes a study of the short story genre and, in so doing, exposes students to several classic examples of Latin American literature. We study the following writers: Jorge Luis Borges, Julio Cortázar, Juan Rulfo, Gabriel García Márquez and Isabel Allende. Studies of the themes and literary techniques of the works, as well as comparisons of the different authors, form the structure of our in-class discussions. Moreover, students will do in-class presentations and write analytical essays on these elements. Some creative writing by students and the viewing of related Spanish-language films are also integrated into the course. The course is conducted in Spanish.

Prerequisite: Honors Spanish 4 or AP Spanish Language and Culture. UC approved.

FRENCH

French 1
Students with little or no previous exposure to French are introduced to the basic elements of the language and to the culture of the French-speaking world. Emphasis is on four basic language skills: listening, speaking, reading and writing, which are developed in context. From the beginning, students are engaged in active communication, promoted through a variety of authentic materials, as well as interactive pair and group projects and activities.

Prerequisite: None. UC approved.

French 2

Students continue to study grammar and vocabulary, and emphasis is placed on written and oral expression, using a variety of more advanced grammar structures. A study of the culture continues while students build the four language skills: listening, speaking, reading and writing. Students demonstrate their understanding of Francophone culture and their language skills in numerous oral and written projects, as well as daily communicative activities and skits. Class is conducted almost exclusively in French.

Prerequisite: French 1. UC approved.

French 3

French 3 is an intermediate French course designed to consolidate the concepts introduced in French 1 and 2. Our theme-based curriculum offers students meaningful contexts to increase their French vocabulary and to develop more complex grammar. Constant interaction in the target language and opportunities to write about topics of interest to teenagers help students communicate more effectively in various verb tenses. Students learn about cultural elements through a virtual trip around the Francophone world supported by readings, songs, video clips and short films analyzed in class. The entire course is conducted in French.

Prerequisite: French 2. UC approved.

Honors French 3

Honors French 3 is an accelerated, intermediate-level French course designed to help students to acquire a greater proficiency in the language at a pace that is appropriate to their ability. The objective of our theme-based curriculum is not only to review and build upon grammar and vocabulary, but also to guide students in incorporating more idiomatic structures of the language into their speech and writing. Constant interaction in the target language and opportunities to write about topics of interest to teenagers help students communicate more effectively in various verb tenses. Students learn about cultural elements through a virtual trip around the Francophone world supported by readings, songs, audio programs, video clips and short films analyzed in class. The course is conducted entirely in French. Upon satisfactory completion of this course, grade 10 and 11 students may opt to take the AP French Language and Culture course.

Prerequisite: French 2 and departmental approval. UC approved.

French 4

French 4 is open to students who have successfully completed French 3. In this course, students work on advanced grammar and vocabulary in order to refine oral and written expression. Students will explore the history and culture through French films, using them as a springboard for class discussions, interactive activities, presentations, as well as written reflections. Students will use various authentic materials, including several full-length feature films, short videos and works.

Prerequisite: French 3 or French 3 Honors. UC approved.

Honors French 4

Honors French 4 is open to students who have successfully completed Honors French 3. This is an accelerated course designed to review advanced grammar and a wide range of vocabulary, with an emphasis on idiomatic structures. In order to develop all four language skills (speaking, writing, reading and listening) students will be exposed to a wide variety of authentic materials, including full-length feature films, short videos and literary works. This rich and varied context will help provide models so that students can explore, improve their linguistic competence, and work towards being able to communicate effectively on a variety of aspects and themes of contemporary Francophone cultures. Upon satisfactory completion of this course, students may take the course in AP French Language.

Prerequisite: Honors French 3. UC approved.

AP French Language and Culture

This intensive course is designed to prepare students for the Advanced Placement French Language examination. It focuses on strengthening all four language skills, according to the AP guidelines. Readings and conversations on topics of current interest are used to advance the acquisition of vocabulary. Students will be provided with numerous opportunities to practice their listening and reading comprehension, as well as their speaking and writing skills. Working on units' portfolios will allow students to do individual research and to present on topics of their interest. The students are expected to take the AP French Language examination in the spring.

Prerequisite: Grade 10 students must have completed Honors French 4, and students in grades 11-12 must have completed French 3 Honors. UC approved.

Honors Advanced Topics in French: French Prose*

This course will expose students to a variety of prose texts, including short stories, plays and novels of various authors from the medieval times to the 21st century. Students will read and analyze these texts focusing on plot, characterization, background and cultural information. This course provides students with an opportunity to study

college-level French literature following the model of the former AP French Literature course.

Prerequisite: Honors French 4 or AP French. UC approved.

Honors Advanced Topics in French: French Literature & Film*

Perhaps more than any other nation, the French hold cinema in great esteem, both as an art form and popular entertainment. This course introduces works of literature, their film adaptations, and the associations between literary and cinematographic texts. Selections will be taken from popular literature as well as established literary tradition. Through these cultural texts, students will not only study aspects of literature and film but also be immersed in Francophone culture while further developing their linguistic and critical thinking skills. This course provides students with an opportunity to study college-level French literature following the model of the former AP French Literature course.

Prerequisite: Honors French 4 or AP French. UC approved.

JAPANESE

Japanese 1

This course will offer students with little or no previous exposure an introduction to the Japanese language. Through the course, students will acquire the basic four language skills (speaking, listening, reading and writing) as well as deepen their socio-cultural knowledge of Japan. By the end of the year, students will have learned to handle short, daily conversations in Japanese and read and write short essays that contain hiragana, katakana, and a small number of kanji characters.

Prerequisite: None. UC approved.

Japanese 2

This course is designed to enhance the four language skills of listening, speaking, reading and writing introduced in Japanese 1. Students will learn about 70 additional kanji characters and read and write with increasing use of kanji. Students' language skills are further developed by the use of technology such as web-based exercises, online testing resources, audio files and videos. By the end of the year, students should be able to create and comprehend essays and dialogues on familiar topics and personal interests. The study of Japanese culture will continue through a variety of activities and the use of audios, videotapes and technology.

Prerequisite: Japanese 1. UC approved.

Japanese 3

Japanese 3 is a continuation of the study undertaken in Japanese 1 and 2. The course is designed to help students develop proficiency in both spoken and written Japanese, while they learn more advanced grammar patterns. Students will continue to develop their reading, writing, listening and speaking skills through a variety of methods. By the end of the year, students should have a broader acquaintance with modern Japanese life and culture through reading and discussing some essays, short stories and videos. They also learn a wide range of vocabulary and sentence patterns so that they can express themselves more effectively, choosing the appropriate level of politeness. A situational and functional approach will expose students to many practical contexts in which they have to perform appropriate tasks. About 75 additional kanji characters will be introduced to the students during the course, and they will practice reading and writing longer passages, letters and essays. Cultural aspects are also introduced through reading, visual aids and the use of videos. Students who complete this class may continue on to Japanese 4.

Prerequisite: Japanese 2. UC approved.

Honors Japanese 3

Japanese 3 Honors is the accelerated continuation of the study undertaken in Japanese 1 and 2. It is designed to review grammar and sentence patterns

at a quick pace with an emphasis on the more complicated grammatical structures. Students who are entering this course are expected to have a very solid understanding of the previously introduced grammar and vocabulary. They will continue to develop proficiency in speaking, listening, reading and writing skills through a variety of methods with an emphasis on more advanced grammatical structures and honorific patterns. They will also learn another 80-90 kanji characters during the school year, and toward the end, they will be introduced to modern Japanese literature (essays, short stories and/or poems) and discuss in class how to better understand Japanese people and their culture.

Prerequisite: Japanese 2 and departmental approval.UC approved.

Japanese 4

This course is designed for students who have successfully completed Japanese 3. Students will continue to develop proficiency in spoken and written Japanese by learning more advanced grammar patterns, the kanji writing system, and pragmatic skills with which they can communicate in the Japanese language more effectively in a variety of contexts. While learning the new material, the students are expected to acquire the oral and aural skills that enable them to converse with people on familiar topics at a more natural speed. By the end of the year, students will have higher communicative skills in Japanese and a broader familiarity with modern Japanese life and culture through a variety of means such as readings, videos and discussions.

Prerequisite: Japanese 3 or Honors Japanese 3. UC approved.

Honors Japanese 4

This accelerated course of Japanese 4 is designed for students who have successfully completed Honors Japanese 3. Students will continue to develop proficiency in spoken and written Japanese by learning more advanced grammar patterns, the kanji writing system, and pragmatic skills with which they can communicate in the Japanese language more effectively and appropriately in a variety of contexts. Students will have increased amount of in-class timed writing and reading exercises as well as speaking exercises (including formal presentations), and they are expected to learn to understand basic information from authentic materials such as advertisements and posters, as well as acquire the oral and aural skills that enable them to converse with people on familiar topics at a more natural speed. They will also learn to comprehend and interpret both written and spoken Japanese on a variety of topics and share information, opinions and ideas with each other. By the end of the year, students will have higher communicative skills in Japanese and a broader familiarity with modern Japanese life and culture through readings, videos and discussions. Students who complete this class are eligible to take AP Japanese the following year.

Prerequisite: Honors Japanese 3. UC approved.

Japanese 5

This course is designed for students who have successfully completed Japanese 4. Students will continue to work on more advanced vocabulary and grammar, and strengthen all language skills in speaking, listening, reading and writing in Japanese. A variety of learning resources, including textbooks, films and short stories, and other authentic materials, will be used in this class; through language and cultural study, students will deepen their understanding of Japanese culture and become familiar with the customs and thoughts of the people of Japan. The course will be conducted mostly in the target language.

Prerequisite: Japanese 4. UC approved.

AP Japanese Language and Culture

This course is designed to prepare students for the AP Japanese Language and Culture examination. It focuses on strengthening the four skills of the Japanese language and cultural studies according to the National Standards for Japanese Language Learning and ACTFL Proficiency Guidelines.

Students will be given extensive practice in various writing, reading and task-oriented oral and aural communication that take place in real-life situations, ultimately preparing them to effectively communicate with native speakers of Japanese. All students are required to take the AP Japanese Language and Culture examination in May.

Prerequisite: Honors Japanese 4 or Japanese 5 with departmental approval. UC approved.

Honors Contemporary Japan

This is a yearlong language course designed to further develop students' ability to communicate and express themselves, enabling them to negotiate real life situations in Japanese. Students will learn an extensive amount of vocabulary and expressions commonly used in Japan as well as increase their understanding of social and cultural elements that are unique to the country while reviewing previously studied grammar and refine their use of it. They will also deepen their understanding of current happenings in Japanese society and develop their ability to discuss such events in the target language, in written and oral form. The class is conducted entirely in Japanese with various authentic materials, discussions and hands-on activities.

Prerequisite: Honors Japanese 4, Japanese 5, or AP Japanese Language and Culture with department approval. UC approved.

LATIN

Latin 1

Students with little or no prior experience in Latin are introduced to the basics of Latin. By reading fictionalized narratives of people living in the Subura district of Rome in the first century C.E., students develop their comprehension of the Latin language and an understanding of the social and political history of the Romans. All students are expected to take the National Latin Exam in the spring. Textbook: *Suburani: A Latin Reading Course, book 1*.

Prerequisite: None. UC approved.

Latin 2

Students continue their study of basic Latin vocabulary, morphology and syntax as they read the ongoing narrative begun in Latin 1. As they review past material and learn new grammar and syntax, students will continue to learn about the history and culture of the Romans, particularly as it pertains to the readings of the course, which are set in Rome and her provinces during the first century AD. All students are expected to take the National Latin Exam in the spring. Textbook: *Suburani, A Latin Reading Course, book 2*.

Prerequisite: Latin 1. UC approved.

Latin 3

In the first semester of this intermediate-level course, students complete the basic course of grammar and vocabulary as they finish reading the fictionalized narrative begun in unit 1. Thereafter, students will read a survey of Latin literature, both poetry and prose, beginning with texts that have been adapted for easier reading, but eventually working to unadapted passages. In this way, students will continue to strengthen their translation and comprehension skills while learning more about the history and culture of the Romans. All students are expected to take the National Latin Exam in the spring. Textbook: *Cambridge Latin Course, unit 4*.

Prerequisite: Latin 2. UC approved.

Honors Latin 3

This course is an accelerated, intermediate-level course designed to review grammar and introduce new vocabulary at a rapid pace while focusing on more advanced and complex grammatical constructions. By reading a survey of unadapted Latin literature, both poetry and prose, students will broaden their knowledge of Roman authors and the various literary genres, as well as strengthen their ability to read and understand more complex Latin.

All students are expected to take the National Latin Exam in the spring. Textbook: *Ecce Romani III*.

Prerequisite: Latin 2 and departmental approval. UC approved.

Latin 4

This course provides an opportunity for students to continue to develop their ability to read complex, continuous Latin. Students will read from a variety of unadapted Latin literature, both poetry and prose, with the goal of reviewing advanced grammar, increasing their vocabulary, increasing their knowledge of Roman authors and the various literary genres, and preparing for AP Latin should they wish to enroll in Latin in the following year. All students are expected to take the National Latin Exam in the spring.

Prerequisite: Latin 3 or Honors Latin 3. UC approved.

AP Latin

This course is designed to prepare students for the AP Latin Exam and to develop students' ability to read, translate and analyze Latin, both poetry and prose. Per AP guidelines, students will apply knowledge of context (political, historical, literary and cultural) to aid in comprehension; identify and analyze grammatical and stylistic features to determine the accurate and literal meaning; read aloud and employ scansion as an aid for reading comprehension; use contextual knowledge to help choose the most appropriate meaning for vocabulary; and understand and discuss a text in its correct literary, cultural political or historical context or framework. All students are expected to take both the National Latin Exam and the AP Latin exam in the spring.

Prerequisite: Honors Latin 3 or Latin 4 and departmental approval. UC approved.

Honors Advanced Latin Literature: Epic*

This course is designed for students who have completed the AP Latin course (Caesar and Vergil) and aims at providing these students with a survey course that will continue to allow these students to develop their translation skills and critical thinking skills, and excel in this subject area. This course includes a selected survey of Latin authors whose works represent the genre of epic poetry. This course may include (but not necessarily be limited to) works by Ennius, Lucretius, Catullus (carmen 64), Vergil, Ovid, and Lucan.

Prerequisite: Successful completion of AP Latin. UC approved.

Honors Advanced Latin Literature: Lyric Poetry*

This course is designed for students who have completed the AP Latin course (Caesar and Vergil) and aims at providing these students with a survey course that will continue to allow these students to develop their translation skills and critical thinking skills, and excel in this subject area. This course includes a selected survey of Latin authors whose works represent the genre of lyric poetry, also known as love poetry. This course may include (but not necessarily be limited to) works by Catullus, Propertius, Tibullus and Ovid.

Prerequisite: Successful completion of AP Latin. UC approved.

Honors Advanced Latin Literature: Prose*

This course includes a survey of prose representing selected works of authors of different genres such as history, epistles and philosophy. Possible authors whose work may be studied include Caesar, Livy, Cicero and Pliny. Students will be able to read, translate, understand, analyze and interpret the passages in the syllabus. Accurate translation, explication, contextual identification of texts, structural analysis and the ability to recognize rhetorical techniques will be the skills students will acquire. Students will also study the historical and cultural settings of the texts.
Prerequisite: Successful completion of AP Latin. UC approved.

Honors Advanced Latin Literature: Satire*

This course is designed for students who have completed the AP Latin course (Caesar and Vergil) and aims at providing these students with a survey course that will continue to allow these students to develop their translation skills and critical thinking skills, and excel in this subject area. This course includes a selected survey of Latin authors whose works represent the genre of satire. This course may include (but not necessarily be limited to) works by Juvenal, Horace, Martial, Petronius, Persius, Seneca and Quintilian.

Prerequisite: Successful completion of AP Latin. UC approved.

CHINESE

Mandarin 1

This is a course for true beginners. By the end of the school year, students will have learned basic survival skills, such as greetings, introductions, asking directions and other real-life conversational situations. Speaking, listening, reading and writing will all be integrated in a comprehensive text-based and multimedia program. Beginning with Pinyin as a foundation for correct pronunciation, we will move on to simplified Chinese and students will learn approximately 250 simplified characters. Grammar concepts are introduced in order of difficulty and continuously reinforced. Projects and holiday celebrations continue to supplement students' understanding of Chinese culture.

Prerequisite: None. UC approved.

Mandarin 2

Mandarin 2 takes beginning students further along the road toward mastering the four skills of reading, writing, speaking and listening. Students will learn approximately additional 300 simplified characters. The approach is performance-based, with an emphasis on student-centered communication activities. Students refine their pronunciation, especially tones, and greatly increase their vocabulary, both spoken and written. They will learn to ask directions, shop, make appointments, discuss the weather and a host of other real-to-life topics. The main text is supplemented with cultural information from movies, websites, magazines and other real-world materials.

Prerequisite: Mandarin 1. UC approved.

Mandarin 3

In this course, students continue to develop the four basic skills of speaking, listening, reading and writing, building upon vocabulary and grammar structures learned in previous years. They learn to write an additional 300 simplified characters. The class is conducted almost entirely in Mandarin, with ample opportunities for students to engage in communicative activities in pairs and groups. Listening comprehension exercises from the textbook and multimedia software are supplemented with short videos and clips from Chinese films. Students develop their writing skills, both by hand and on the computer, in a variety of formats and modes. Projects and holiday celebrations continue to supplement students' understanding of Chinese culture.

Prerequisite: Mandarin 2. UC approved.

Honors Mandarin 3

This course is designed for highly motivated students who are prepared for more intensive study of Mandarin. Students continue to develop the four basic skills of speaking, listening, reading and writing, building upon vocabulary and grammar structures learned in previous years. They learn to write an additional 300 simplified characters. The class is conducted almost entirely in Mandarin, with ample opportunities for students to engage in communicative activities in pairs and groups. Listening and comprehension exercises focus on authentic materials such as short videos and segments from Chinese films. Writing assignments in a variety of formats and modes challenge students to apply increasingly complex grammar, vocabulary and idioms. Students conduct intensive research projects on a variety of cultural topics

which they present to the class. Field trips and holiday celebrations continue to supplement students' understanding of Chinese culture.

Prerequisite: Mandarin 2 and departmental approval. UC approved.

Mandarin 4

In this course, students focus on improving their communication skills in Mandarin. They further develop the four basic skills of speaking, listening, reading and writing by building upon vocabulary and grammar structures learned in previous years' and learning to write an additional 300 simplified characters. The class is conducted almost entirely in Mandarin, with a continuing emphasis on communicative activities in pairs and groups. Listening comprehension exercises drawn from Chinese media and longer film clips expose students to a variety of authentic speakers and cultural products. Students further develop their writing skills, progressing to short essays in various genres. Projects and holiday celebrations continue to supplement students' understanding of Chinese culture.

Prerequisite: Mandarin 3 or Honors Mandarin 3. UC approved.

Honors Mandarin 4

In this challenging course, students focus on improving their communication skills in Mandarin, in preparation for AP Chinese. They further develop the four basic skills of speaking, listening, reading and writing, building upon vocabulary and grammar structures learned in previous years, and learn to write an additional 300 simplified characters. The class is conducted almost entirely in Mandarin, with a continuing emphasis on communicative activities in pairs and groups. Listening comprehension exercises drawn from Chinese media and longer film clips expose students to a variety of authentic speakers and cultural products. Students further develop their writing skills, writing short essays in various genres. Chinese culture becomes a focus, via research and projects, and holiday celebrations.

Prerequisite: Honors Mandarin 3. UC approved.

AP Chinese Language and Culture

This class, roughly equivalent to a fourth-semester college course, continues the intensive pace of Mandarin 4 Honors and is designed to prepare students for the AP Chinese Language and Culture exam. The class is conducted mainly in Mandarin, and students are expected to perform to a high standard to remain in the class. Communicative exercises, Chinese films and other media, and extended presentations on a variety of cultural topics help students develop solid communicative skills in all modes. In a variety of writing assignments, students are challenged to make use of increasingly complex grammar structures, sophisticated vocabulary and a growing repertoire of idioms. Students learn an additional 300 characters in both simplified and traditional forms, although they may choose to write in either form. Culturally rich reading assignments derived from authentic texts supplement the basic textbook.

Prerequisite: Honors Mandarin 4. UC approved.

Honors Advanced Topics in Chinese: Literature and Culture*

This course is designed to deepen students' understanding of Chinese literature and culture while refining their language skills. In addition to classic and contemporary Chinese literature, the course explores the practices, perspectives, and products of traditional and modern Chinese culture through various cultural topics. Students will enhance their proficiency in listening, speaking, reading, and writing in Mandarin while developing critical thinking skills through cultural analysis. Conducted entirely in Mandarin, the course utilizes a wide range of authentic materials, such as classical and modern Chinese texts, films, TV programs, news and articles. Students showcase their learning and broaden their cultural insights through frequent discussions, comparative essays, cultural presentations and projects, and hands-on activities.

Prerequisite: Honors Mandarin 4 or AP Chinese. UC approved.

Honors Advanced Topics in Chinese: Contemporary China*

This course immerses students in contemporary China, enhancing their understanding of modern Chinese society while refining language skills. Students will explore topics such as daily life, technological advancements, economic development, and social issues in contemporary China, while also analyzing cultural differences between China and the U.S. The course emphasizes continuous improvement in Mandarin proficiency in listening, speaking, reading and writing, alongside critical thinking skills through regular discussions, comparative essays, cultural presentations and projects, and role-playing activities. Conducted entirely in Mandarin, this course draws on authentic resources, such as social media posts, apps, films, TV programs, news and articles on a variety of topics, to create a dynamic and engaging learning experience.

Prerequisite: Honors Mandarin 4 or AP Chinese. UC approved.

Physical Education

Physical education is an important aspect of a total education. A healthy human being should develop mind, body and spirit. Some form of daily physical activity should become part of each person's life in order to promote health and develop fitness. We offer opportunities for decision-making and confidence-building while learning fair play and teamwork. We hope to have students develop an appreciation for their own talents and the talents of others. Students may fulfill the physical education requirement through election of programs in noncompetitive athletic endeavors, competitive team sports or through a traditional physical education program. Students may also choose to elect a combination of the above programs. The 0.5 units for the semester activity listed below count toward the two P.E. credits required to graduate. P.E. classes are not graded and are therefore not included on student transcripts.

COMPETITIVE SPORTS
Note: All competitive sports offered for one season.

Baseball (1 season/0.5 unit)
Open to boys and girls; offered in spring. Students who wish to play baseball at a competitive level may be eligible for this activity. Students will receive instruction in fundamentals and proper baseball techniques and strategies. Students will compete against other schools in the California Interscholastic Federation.
Prerequisite: Open to grades 9-12 students by tryout.

Boys Basketball (1 season/0.5 unit)
Girls Basketball (1 season/0.5 unit)
Open to boys and girls; offered in winter. Students who wish to play competitive basketball may be eligible for these teams. Teams compete with high schools in the local league. Practices stress strengthening and polishing basic skills, learning offenses and defenses, and sharpening reactions to tactical situations.
Prerequisite: Open to grade 9-12 students by tryout.

Cheerleading (1 season/0.5 unit)
Open to all students, grade 9-12; offered in fall and winter. In modern cheerleading, all athletes are expected to give their all to the team. It combines traditional cheerleading with dance and tumbling moves. The team cheers at a variety of events including school rallies as well as home and away football and basketball games. The squad prides itself on showing school spirit while exhibiting excellence in academics and athleticism.

Boys Cross Country (1 season/0.5 unit)
Girls Cross Country (1 season/0.5 unit)
Open to boys and girls; offered in fall. Grade 9-12 students who are interested in competitive cross country events may try out for these teams. Cross country develops the stamina and speed necessary to race the three-mile distance. Beginners are welcome to join the team; the training runs are adjusted to suit each runner's ability.
Prerequisite: None.

Football (1 season/0.5 unit)
Open to boys and girls; offered in fall. Students who are interested in competitive play may try out for this team. The football program offers instruction in fundamentals and proper football techniques. This program is competitive and involves a high level of skill and an emphasis on football strategies.
Prerequisite: Open to grade 9-12 students by tryout.

Boys Golf (1 season/0.5 unit)
Girls Golf (1 season/0.5 unit)
Open to boys in the spring, girls in the fall. Students who are interested in competitive play may try out for these teams. Participation and practice take place at golf driving ranges and local golf courses and country clubs. Participants provide their own clubs. Competitions are arranged with leagues.

Prerequisite: Open to grade 9-12 students by tryout.

Girls Lacrosse (1 season/0.5 unit)
Open to girls; offered in spring. Students who are interested in competitive play may try out for this team. The lacrosse program offers instruction in fundamentals and proper lacrosse technique.

Prerequisite: Open to grade 9-12 girls by tryout.

Boys Soccer (1 season/0.5 unit)
Girls Soccer (1 season/0.5 unit)
Open to boys and girls; offered in winter. Interested students may try out for these teams. This activity is geared towards serious, competitive play. The emphasis is on participation and healthy competition. Students will compete against other schools in the California Interscholastic Federation.

Prerequisite: Open to grade 9-12 students by tryout.

Girls Softball (1 season/0.5 unit)
Open to girls only; offered in spring. Girls who wish to play competitive softball may be eligible for this team. The students will receive instruction in fundamental and proper softball techniques and strategies. Students will compete in the California Interscholastic Federation.

Prerequisite: Open to grade 9-12 girls by tryout.

Boys Swimming (1 season/0.5 unit)
Girls Swimming (1 season/0.5 unit)
Offered in spring. Students who are interested in competitive swimming may try out for these teams. Swimming is offered to both girls and boys, with or without competitive experience. Emphasis will be on stroke technique, race strategies and training.

Prerequisite: Open to grade 9-12 students by tryout.

Boys Tennis (1 season/0.5 unit)
Girls Tennis (1 season/0.5 unit)
Boys offered in spring; girls offered in fall. Students who are interested in competitive tennis may try out for these teams. Harker fields both boys and girls teams in interscholastic tennis. Play includes both singles and doubles matches against local public and private schools.

Prerequisite: Open to grade 9-12 students by tryout.

Boys Track and Field (1 season/0.5 unit)
Girls Track and Field (1 season/0.5 unit)
Open to boys and girls; offered in spring. Emphasis is on running technique for sprints, distance and hurdles. Field events include high jump, long jump, triple jump, shot put and discus.

Prerequisite: Open to grade 9-12 students by tryout.

Boys Volleyball (1 season/0.5 unit)
Girls Volleyball (1 season/0.5 unit)
Open to boys and girls; boys offered in spring; girls offered in fall. Practices are designed to improve team play and individual skills and consist of high-level drills. Volleyball teams play a competitive interscholastic schedule against other private and public schools.

Prerequisite: Open to grade 9-12 students by tryout.

Boys Water Polo (1 season/0.5 unit)
Girls Water Polo (1 season/0.5 unit)
Open to boys and girls; boys offered in spring, girls offered in fall. Students who wish to play competitive water polo may be eligible for this team. The students will receive instruction in fundamental and proper water polo techniques and

strategies. Students will compete in the California Interscholastic Federation.

Prerequisite: Open to grade 9-12 students by tryout.

NONCOMPETITIVE SPORTS
All noncompetitive sports offerings are subject to sufficient student demand and faculty availability.

Capoeira* (1 semester/0.5 unit)
Capoeira is an Afro-Brazilian martial art which combines self defense, dance and music. Capoeira increases flexibility, coordination, strength, balance and self-confidence. Capoeira possesses a very unique style that brings together beauty and power, developing mental balance, physical conditioning, self defense, music and a profound sense of art. Capoeira can be done by anyone of any age or size. No athletic skill is required to participate.

Prerequisite: None.

Fencing* (1 semester/0.5 unit)
In this unique and challenging lifelong sport you will learn the fundamentals of Olympic fencing technique, footwork and strategy. This low-pressure, fun-filled environment helps students develop hand-eye coordination, increase overall fitness, improve mental focus, and build confidence.

Prerequisite: None.

Personal Fitness* (1 semester/0.5 unit)
The goal of the personal fitness class is to target the components of fitness which include cardio-respiratory endurance, muscular endurance, muscular strength, and flexibility. Students learn how to develop a well-rounded workout routine that integrates resistance training, cardiovascular workouts, mobility work, balance training and more. Students will gain experience, proficiency and confidence in the execution of a wide variety of exercises and activities. This class is appropriate for students with little or no fitness or strength training experience. Offered during the school day.

Prerequisite: None.

Self Defense* (1 semester/0.5 unit)

This class is based on the Inayan system of Eskrima, an internationally recognized martial art founded in Los Gatos. This system has been taught to law enforcement and military groups around the world.

Students will learn situational awareness, personal safety strategies, and practical self-defense techniques. The course includes both empty-hand defense and the use of tools, all taught in a safe and constructive environment. No martial arts background is required, and all skill levels are welcome.

Prerequisite: None.

Yoga* (1 semester/0.5 unit)
This class will consist of one hour of Iyengar-style yoga asanas (physical poses). This style of yoga develops flexibility, strength, balance and endurance. Other benefits include stress reduction, improved energy, back and neck pain relief and relief of mental strain from studying. Students will be required to do an hour of yoga on their own each week and will write about it in a yoga journal, due at the end of the semester.

Prerequisite: None.

Science

Our rapidly changing world offers challenges and opportunities. Groundbreaking advancements in technology, engineering and health coupled with pressures associated with climate change, depleting resources and social justice demand that ordinary people have a good knowledge of scientific principles in order to function well as responsible citizens. Harker's program provides a very strong background in science for every student. For those who plan careers in science or technology, the program is designed to provide maximum opportunity for advanced placement studies or elective opportunities in the sciences. All science courses stress problem-solving and laboratory experience. The research program provides support for students to engage in individualized scientific research.

REQUIRED COURSES - GRADE 9
All students are required to take either Physics or Honors Physics. The science department offers two courses in physics, both of which satisfy the graduation requirement.

Physics

This introductory physics course includes the study of motion, forces, momentum, energy, electric charge, circuits, magnetism and waves. The emphasis is conceptual rather than mathematical. Lab activities and demonstrations are major components of the course. Students will use computers for data collection, analysis and simulations.

Prerequisite: None. UC approved.

Honors Physics

This introductory physics course includes the study of motion, forces, momentum, energy, electric charge, circuits, magnetism and waves. The emphasis is on conceptualization and rigorous problem-solving. Analysis of experimental data is used to construct mathematical and conceptual models. Lab activities and demonstrations are major components of the course. Students will use computers for data collection, analysis and simulations.

Prerequisite: Concurrent enrollment in Honors Geometry or higher mathematics course and departmental approval. UC approved.

REQUIRED COURSES - GRADE 10
All students are required to take a chemistry course in grade 10. The science department offers three yearlong courses: Chemistry, Honors Chemistry and AP Chemistry. AP Chemistry is available to grade 10 students who obtain departmental approval and successfully complete a summer course. AP Chemistry is also available to students in grades 11-12 who qualify and receive departmental approval.

Chemistry

This course emphasizes both a conceptual and quantitative understanding of chemistry. Atomic theory, chemical bonding, acid-base behavior, oxidation reduction and other kinds of reactions are studied. Students conduct many laboratory experiments to develop an understanding of chemical principles as related to everyday life.

Prerequisite: Physics or Honors Physics. UC approved.

Honors Chemistry

This course serves as an introduction to modern chemistry. Atomic structure, bonding, phase change, solutions, chemical reactions, thermodynamics, acid-base equilibria, kinetics and aspects of organic and inorganic chemistry are included. Emphasis is placed on developing problem-solving skills. This course incorporates lab work.

Prerequisite: Physics or Honors Physics and departmental approval. UC approved.

REQUIRED COURSES - GRADE 11
All students are required to take a biology course in grade 11. AP Biology is available to grade 11 students who obtain department approval and successfully complete a summer course. AP Biology is also available to students in grade 12 who qualify and receive departmental approval.

Biology

This yearlong introductory lab science explores core concepts in biology and the relevancy of these topics to the lives of students. Students will explore basic biochemistry, principles of ecology, conservation biology and the impacts of climate change on ecosystems, cell structure and function, metabolism and energy transformation, cell division and the regulation of the cell cycle, and classical genetics. The second semester will cover topics in molecular biology, evolution and classification, organismal biology, and anatomy and physiology.

Prerequisite: Chemistry, Honors Chemistry or AP Chemistry. UC approved.

Honors Biology

This course is designed for students who have a proven interest and ability in science. This yearlong course provides a detailed view of fundamental biological processes, cell structures and function, molecular and classical genetics, basic biochemistry, evolution, anatomy and physiology, and ecology.

Prerequisite: Chemistry, Honors Chemistry or AP Chemistry and departmental approval. (Students from Chemistry may not take both Honors Biology and AP Chemistry concurrently during grade 11.) UC approved.

ELECTIVE CLASSES

AP Biology

This yearlong lab course prepares students for the AP Biology examination. Included in this course are biochemistry, cytology and cellular energy transformations, taxonomy, ecology and population dynamics and molecular genetics, heredity and evolution.

Prerequisite: Grade 11: AP Biology is available to students in grade 11 who satisfy department requirements to take the course (from Honors Chemistry an A- or better for the first semester; from AP Chemistry a B+ or better for the first semester), obtain departmental approval and successfully complete a Harker summer course (by invitation only). Grade 12: A or better in Biology or B+ or better in Honors Biology and department approval. UC approved.

AP Chemistry

This course is the equivalent of an introductory college general chemistry course. We begin with a brief review of some basic topics in chemistry relating to the nature of atoms, molecules, ions, the concept of mole and stoichiometry. This is followed by a more in-depth discussion of the electronic structure of atoms, the nature of chemical bonding and how it relates to states of matter, thermo-chemistry, chemical kinetics, chemical equilibrium, thermodynamics and electrochemistry. We will also touch upon basic organic and nuclear chemistry. A major objective of this course is to understand basic principles and apply them towards solving comprehensive problems. The course is integrated with a rigorous laboratory program. Students who have completed this course will be prepared to take the AP Chemistry examination.

Prerequisite: Grade 10: AP Chemistry is available to grade 10 students who satisfy department requirements to take the course, earn an A or better in semester 1 of Honors Physics, obtain department approval and successfully complete a Harker summer course (by invitation only). Grade 11 & 12: Honors Chemistry and departmental approval or Chemistry with course grade of “A” both semesters and departmental approval. (Students from Chemistry may not take both Honors Biology and AP Chemistry concurrently during grade 11.) UC approved.

AP Environmental Science

AP Environmental Science is a lab-based grade 12 elective. The class is interdisciplinary in nature, drawing on students’ backgrounds in biology, chemistry and physics. Topics covered include earth systems and resources, the living world, population, land and water use, energy resources and consumption, pollution and global change. Students are prepared for the AP Environmental Science exam in the spring.

Prerequisite: Successful completion of grade 11 Biology course and department approval. UC Approved.

AP Physics 2

This course follows all directives as set by the College Board in their description of the AP Physics 2 course. This course continues the systematic introduction to the main principles of physics that began in the grade 9 physics course and emphasizes the development of conceptual understanding and problem-solving ability using algebra and trigonometry. The Physics 2 course includes topics in both classical and modern physics. Knowledge of algebra and basic trigonometry is required; the basic ideas of calculus may be introduced in the theoretical development of some physical concepts, such as acceleration and work. Understanding of the basic principles involved and the ability to apply these principles in the solution of problems is a major goal of the course, which serves as preparation for the AP Physics 2 exam.

Prerequisite: Students who completed Honors Physics with a B+ both semesters or Physics with an A both semesters, have been approved for Honors Precalculus or higher level math course, and earn department approval are eligible for AP Physics 2. UC approved.

AP Physics C

This course follows all course directives as set by the College Board in their description of the AP Physics C course. This yearlong, calculus-based physics course is composed of roughly one-half mechanics (including linear and rotational kinematics and dynamics) and one-half electricity and magnetism. Methods of calculus are used wherever appropriate in formulating physical principles and in applying them to physical problems. The sequence is more intensive and analytic than that in AP Physics 2. Strong emphasis is placed on solving a variety of challenging problems, some requiring calculus. After this course students will take the AP Physics C exam in Mechanics and Electricity and Magnetism.

Prerequisite: AP Physics C is designed for students who have earned A- or higher grades in Honors Physics and have completed, or for grade 12 students who are enrolled in, Calculus. Priority will be given to students who have completed AP Calculus BC or Honors Calculus C. Department approval required. UC approved.

Honors Analytical Chemistry*

Analytical Chemistry is to be taken after either the successful completion of Honors Chemistry or Advanced Placement Chemistry. The course is modeled after similar courses taught by college chemistry departments at either the sophomore or junior level. It will cover both fundamental and practical aspects of chemical analysis utilizing both classical and modern techniques drawn from many areas of science including but not limited to the following: life sciences, environmental chemistry, clinical chemistry and industrial analysis. The first portion of the course will emphasize traditional techniques including gravimetric analysis, titrimetric methods of analysis including precipitation,

acid-base and complexes, as well as electrochemical methods. The second half of the course will focus on the use of instrumentation with emphasis placed on spectroscopy and chromatography. The entire course will be heavily experimentally oriented with the majority of the students' classroom time being spent in the chemistry laboratory.

Prerequisite: Honors or AP Chemistry and department approval. UC approved.

Astronomy*

This one-semester elective course will give students a general overview of the fundamental principles of astronomy. Students learn about the history of astronomy and astronomical instrumentation. The observational component of the course covers constellations, the celestial sphere and the motions of heavenly bodies. A discussion of telescope types (optical, infrared, radio, X-ray and gamma ray) and uses will complement this section. The course then moves into light, spectra, stars, star formation and stellar evolution. A detailed look at the sun (the star we know best) will assist students in understanding the life cycle of stars. The demise of stars gives us such fascinating objects as white dwarfs, planetary nebulae, supernovae, neutron stars, pulsars and black holes. The course culminates with the topic of galaxy formation and evolution, with a central focus on the details relating to the Milky Way, our galaxy.

Prerequisite: Physics or Honors Physics. UC approved.

Honors Bioinformatics*

Honors Bioinformatics is the interdisciplinary study of biological information, combining molecular biology with modern data science. In this course, students will gain hands-on experience with DNA sequencing, learning both the laboratory and computational techniques used in cutting-edge research. Using the school's Illumina DNA sequencer and PCR equipment, students will generate and analyze their own sequence data. Course topics include DNA sequencing technologies, genome assembly, sequence alignment, annotation and applications. Students will learn how to use bioinformatics platforms to assess sequencing quality, explore genomic data, and answer real biological questions. The course also extends beyond genomics into proteomics, where students will explore how proteins can be studied using artificial intelligence tools. Students will learn how to predict protein structures, investigate their biological roles, and apply computational approaches to study real-world protein questions.

Prerequisites: at least one semester of biology with an A, or one semester of biology honors/AP Biology with a B or higher.

Biomedical Ethics*

Bioethics is the study of ethical issues related to medicine, public health and the life sciences. In this course, students will explore contemporary issues in bioethics, including genetic engineering technologies such as CRISPR and GMOs, policies around vaccination and organ transplantation, reproductive technologies, the ethics of scientific research and animal experimentation, and "end of life" decisions. Through reading, writing, research, role playing and discussion, students will explore the basic bioethical issues related to each topic or technology, deepen their understanding of biological concepts, strengthen their critical-thinking skills, and learn to engage in respectful dialogue with people whose views may differ from their own.

Prerequisite: Completion of grade 9 science requirement. UC approved.

Biotechnology*

Biotechnology is the use of living organisms or their products to enhance our lives and our environment. The course is lab-based, providing students exposure to many of the basic techniques used in biotechnology today. Students will conduct novel research to improve our knowledge about the local environment. This course also examines fundamental issues of biotechnology, such as how it impacts the lives of humans, other animals, plants

and the environment. We also look at ethical issues about the role of science and technology in our society.

Prerequisite: Completion of first semester of Biology, Honors Biology or AP Biology. Preference given to grade 12 students. UC approved.

Electronics*

The primary objective of this course is to introduce the basic principles of electric circuits through experimentation and laboratory-based activities. The emphasis in the course will be on analog circuits with an introduction to digital electronics at the end of the semester. Specific objectives include: recognizing safe electrical hazards and practicing proper safety procedures in the laboratory; identifying components from a circuit diagram; constructing circuits from circuit diagrams; decomposing circuits into parallel and series networks and applying Thevenin's theorem to simplify circuits for analysis; applying Kirchoff's Laws and Ohm's Law to analyze a circuit; applying various mathematics modes to analyze circuits including solving simultaneous equations, logarithms, exponentials and sinusoidal functions; making accurate electric measurements using a digital multimeter and oscilloscope; developing techniques for troubleshooting electric circuits; designing and building a complex circuit using various components and solderless breadboards; and designing and building a complex circuit using the software Multisim, or similar.

Prerequisite: Physics or Honors Physics. UC approved.

Honors Human Anatomy and Physiology

This yearlong lab course begins with a microscopic study of the cytology of tissues and then explores the physiology of the major systems of the human body. Laboratory work includes a systematic dissection of a cat, plus a study of other specimens. Current trends and research in the areas of nutrition, health and disease are discussed.

Prerequisite: A or better in Biology or B or better in Honors or AP Biology and department approval. UC approved.

Honors Cancer Biology*

Honors Cancer Biology is an advanced elective for students who have completed Biology and want to explore cancer as both a biological phenomenon and a global health challenge. The course examines how normal cells function and how genetic mutations disrupt these processes, leading to tumor development, progression, and spread throughout the body. Students investigate cancer from multiple biological perspectives - from cell biology to epidemiology - using a hands-on approach that integrates lab work, data analysis, and bioinformatics to study the genetics of cancer.

The curriculum is organized around essential questions that move from molecular mechanisms to organism-level impacts: What is cancer? How do normal cells become cancerous? How does it spread, and how can it be detected or treated? Students engage in case studies, projects and lab investigations to explore how tools such as imaging, genetic screening and artificial intelligence are transforming diagnosis and treatment.

This course is designed for inquiry and problem solving, encouraging students to guide their own research and connect biological concepts to real-world health challenges. The goal is for students to gain a deeper understanding of cancer biology while developing the skills and perspectives needed for future study in biology, medicine or public health.

Prerequisites: At least one semester of biology with an A, or one semester of biology honors/AP Biology with a B or higher.

Forensic Science*

This course is designed to provide an overview of the basic science concepts and techniques used in a forensic laboratory. The nature and significance of physical evidence and the underlying chemical and biological principles of the scientific techniques employed for analysis and interpretation will be

emphasized. Topics covered include hair and fiber analysis, forensic toxicology and serology, blood spatter evidence, pollen analysis, forensic entomology, forensic anthropology, fingerprinting and forensic DNA analysis.

Prerequisite: Completion of grade 9 science requirement. UC approved.

Honors Introduction to Nanoscience*

This course introduces students to the emerging field of nanoscale science and engineering (NSE), an area that is rapidly transforming the way we look at the properties of materials, and their applications in the real world. We begin with a broad overview on why the properties of nanomaterials differ from those of the corresponding bulk materials, how we synthesize nanomaterials, and the need for new tools to see and manipulate objects that are so small. The second part of the course focuses on exploring the applications of nanoscience in medicine, energy and environment, technology, and the use of nanomaterials in everyday products. Students are encouraged to think with an interdisciplinary mindset by drawing on their knowledge of math, chemistry, physics and biology. Inquiry-based labs and visual tools are used extensively to explore various topics.

Prerequisite: Honors or AP Chemistry and department approval. UC approved.

Research Methods*

Research Methods is a fall semester elective designed for students interested in conducting scientific research. No prior science project experience is necessary. Students have the opportunity to investigate a topic of interest while participating in a community of fellow student researchers. Elements of science history and modern science are woven into the curriculum. After basic skill training in experimental design, analysis and communication, students conduct a practice project in groups. They conduct statistical analysis, write formal reports and deliver oral presentations. They finish the semester with a formal proposal for an independent research project. Students may enroll in the Advanced Research class to conduct their proposed project if it is approved. Those who conduct a project may then participate in a regional science fair or attend the Harker Research Symposium.

Prerequisite: Physics or Honors Physics and recommendation of the student's science and/or mathematics teacher. UC approved.

Honors Advanced Research*

Honors Advanced Research is primarily an independent study course. Students set their own goals consistent with the grading requirements, which include peer feedback, formal communications, technical writing, and class activities like Journal Club discussions. Students must be self-motivated and resourceful to pursue their project goals. Students have the option of continuing their research projects from the Research Methods course, or they may pursue a new project in a field of their choice. Advanced Research may be taken for credit more than once.

Prerequisite: Research Methods.

Seminar in Modern Physics*

Using a conceptual approach, this course covers the discoveries and methods of analysis that are the basis of 20th-century physics. The course opens with Planck's discovery of the relationship for the quantization of energy that led to the correct mathematical description of blackbody radiation and resolved the ultraviolet catastrophe that had plagued the physics of radiative transfer. The course then moves into special relativity, deriving the Lorentz transformations as well as $E=mc^2$, and then the concepts underlying general relativity. From there the course moves into quantum mechanics covering wave-particle duality, superposition of states, quantum entanglement (which earned the 2022 Nobel Prize in Physics) and the four fundamental forces of nature. An introduction to nuclear physics and radioactivity then lead into discussions in cosmology, the origin, evolution and composition of the universe, dark matter and dark energy. The semester ends with

discussions of horizon topics such as loop quantum gravity, string theory, modified Newtonian dynamics and warp drive.

Prerequisite: Physics or Honors Physics. UC approved.

Study of Organic Chemistry*

This course introduces students to the fundamentals of organic chemistry and its application to everyday life and biological processes. The chemistry of carbon is explored in the context of functional groups, nomenclature, properties and reaction mechanisms. The goal is to get students familiar with structures and bonding in organic compounds, so they can succeed in introductory college organic/biochemistry courses. In addition, students are introduced to a variety of experimental techniques that are commonly employed in the synthesis and purification of organic compounds.

Prerequisite: Chemistry, Honors Chemistry or AP Chemistry and departmental approval. UC approved.

Speech and Debate

The speech and debate department provides students with a breadth of opportunities in debate (congressional, public forum and Lincoln-Douglas formats) and speech events. The lifelong value of written and oral communication skills are emphasized within an environment that encourages students to participate in local, regional and national tournament competitions. There is an emphasis on critical thinking, research, argumentation and presentation. Travel fees apply for tournament competitions. All courses in speech and debate count as Extra Period Options and can be taken in addition to their full academic loads.

Introduction to Speech and Debate (1 year/0.5 credit)

Introduction to Speech and Debate provides students with an introduction to public speaking and argumentation through practical application. Students will work on presentation, research, critical writing and argumentation skills. The class will focus on public forum, Lincoln-Douglas debate, congressional debate and speech. Evaluation is based on classwork and in-class participation. This course requires no previous experience. If a student has taken a speech or debate class but does not have prior tournament competitions in one of the events, this class is a better fit than our intermediate course. The course carries one-half credit for a full year of participation.

Prerequisite: None

Intermediate Speech and Debate (1 year/0.5 credit)

Students enrolled in one of these courses below have had significant prior tournament competition experience in the specific event chosen. Students will focus on building communication skills and preparing for tournaments by developing persuasive speeches, researching, performing interpretations of literature or building extemporaneous speaking skills. Evaluation is based on classwork and in-class participation. The course carries one-half credit for a full year of participation.

Prerequisite: Department approval

- Intermediate Speech & Debate: Lincoln-Douglas
- Intermediate Speech & Debate: Public Forum
- Intermediate Speech & Congress

Competitive Speech and Debate (1 year/not for credit)

Students involved in the competitive speech and debate program are required to enroll in one of these non-credit, Extra Period Option classes. Prerequisite: Introduction or Intermediate Speech and Debate.

- Competitive Speech and Debate: Lincoln Douglas
- Competitive Speech and Debate: Public Forum
- Competitive Speech & Congress

Performing Arts

The performing arts department provides students with a place to express their creativity and gain an important perspective of the arts in our culture. Dance, drama, technical theater, instrumental music, vocal music, theory and more are offered in an environment where students can experiment safely and nurture their artistic passions. Students are provided a forum in which to demonstrate their ability via productions and concerts, thus enriching both Harker and the community.

Conservatory
Students may participate in all aspects of The Conservatory at any time or, in grades 9-10, choose to be a part of The Conservatory Certificate Program. The Certificate Program guides students through a comprehensive course of study in all of the disciplines, with a special emphasis in the discipline of the student's choice: technical theater, theater, musical theater, instrumental music, vocal music or dance. Program requirements include courses and workshops in disciplines other than the student's emphasis, involvement in productions/ ensembles/festivals, sophomore juries and through live performance critiques in a variety of genres, including dramas, musicals and concerts. The program culminates in grade 12 with a final presentation to the faculty advisory panel and a formal performance of pieces from the student's portfolio, accompanied by the presentation of the Certificate.

REQUIRED CLASSES
All students must complete one full year of an artistic class, normally in grade 9. Courses which satisfy this requirement are Study of Dance, Study of Theater Arts, Study of Music, Study of Visual Arts, and Study of Technical Theater.

Study of Dance

A study of dance builds problem-solving and creative thinking skills. As students focus on perceiving, comprehending, imagining and evaluating, they develop strong interpretive, analytical and critical thinking skills. By learning to make choices within structure, dance students learn to develop individual and group solutions to complex problems. Dance curricula provide many opportunities for students to articulate complex problems and to practice divergent and nonlinear thinking in order to generate solutions. The process of exploring the art of dance allows students to develop their communication skills and acquire new symbolic literacy. Students will also develop dance skills, choreography knowledge and a historical perspective of dance. Note that Study of Dance is an academic course and, unlike the after-school dance courses, it does not satisfy the P.E. requirement.

Prerequisite: None. UC approved.

Study of Music

Music is an exciting world intersecting with history, politics, sociology, mathematics, physics, psychology, literature and art. The Study of Music class explores these intersections from the past and the present, looking not only at global music but also Western classical music and popular genres. Students will learn the musical elements through a global music perspective and notation and classical repertoire of Western music. They will also explore self-expression through basic composition exercises.

Prerequisite: None. UC approved.

Study of Technical Theater

This yearlong course provides students with an immersive exploration of the tools, techniques and terminologies used in the world of production. With an eye to history we will explore the practical considerations that have shaped the performance space and the evolution of production resources (scenery, lighting, costume, sound and properties). Students will learn how to use tools safely for scenic construction, foundations of costume research and design, light board programming and operation, and sound reinforcement and engineering. The applications of production in all aspects of performance will also be explored, with attention to how the demands of dance, choral music, orchestral music and opera have shaped and expanded the role of tech in presentations.

Prerequisite: None. UC approved.

Study of Theater Arts

This course gives students an understanding of theater as it exists today and provides a common vocabulary covering all aspects of modern stage performance, production and history. Through individual exploration, group discussion and practical experience, students will examine the forces throughout history that have shaped the evolution of acting, directing, technical theater and musical theater. By examining theater from many regions and styles, students gain an appreciation of the skills employed by theater artists today and those artists whose works endure.

Prerequisite: None. UC approved.

PERFORMING ARTS ELECTIVES

Advanced Acting*

This continues the study of acting developed in Study of Theater Arts. Using dramatic and comedic monologues as a backdrop, students learn to make specific acting choices and create dynamic, strong characters. By videotaping their work regularly, students learn to analyze their work and make adjustments. Monologues will be performed both for a student audience and taken to a festival for adjudication. Students also design their resumes for future auditions.

Prerequisite: Study of Theater Arts and/or departmental approval. UC approved.

Advanced Scene Study*

Advanced Scene Study is tailored for committed acting students eager to elevate their technique through in-depth scene work with contemporary comedic and dramatic material. This course emphasizes a rigorous exploration of character motivations, objectives and emotional nuance, helping students develop complex, believable characters. Students will work on refining their stage presence, making sophisticated acting and blocking choices, and navigating intricate character relationships. The course also integrates feedback and self-reflection, encouraging actors to sharpen their instincts and adaptability in response to dynamic, real-time scene work. Final performance for an audience at the end of class.

Prerequisite: Advanced Acting and previous stage experience recommended but not required. UC approved.

Vocal Interpretation*

Vocal Interpretation provides advanced theater, musical theater and vocal students with the tools to expressively convey meaning and emotion through vocal music selections, whether for musical theater, classical or contemporary repertoire. This course focuses on the relationship between vocal technique and emotional storytelling, teaching students to connect deeply with lyrics and use their voice and body to communicate character and intent. Through exercises in breath control, tone variation, and expressive phrasing, blocking and emotional beat work, students learn to enhance their vocal presence and create powerful, resonant performances that captivate an audience. Emphasis is placed on making intentional vocal choices and developing a strong, authentic connection to the material. Final performance at the end of class.

Prerequisites: For singers: Open to any student, with priority given to musical theater and vocal certificate candidates; one year of choral ensemble experience and voice instruction recommended but not required.

Shakespeare in Performance*

Shakespeare in Performance immerses students in the iconic world of Shakespearean drama, focusing on the language, rhythm and thematic depth that define his works. This course is designed to help students unlock the intricacies of Elizabethan language, use vocal and physical expression to bring Shakespeare's characters to life, and explore the timeless human themes embedded in his plays. Through exercises in scansion, iambic pentameter, and understanding rhetorical devices, students will gain the skills to perform Shakespeare's text with clarity and emotional impact. This course challenges actors to make bold, informed acting choices, enhancing their understanding of classical texts and expanding their repertoire with iconic roles.

Prerequisite: Advanced Acting and previous stage experience recommended but not required. UC approved.

Student-Directed Showcase*

This class is offered to selected grade 12 students, who are given the rare opportunity to direct Conservatory students in a series of one-act plays performed in January for the Harker and outside communities. Students follow a rigorous curriculum as they study the art of directing and ultimately apply their skills to a fully produced production. An application and interview process is required. No more than four students are admitted based upon their experience and application.

Prerequisite: Advanced Scene Study, Advanced Acting, stage experience in musical, SDS, or play as cast member, and application required. UC approved.

Acting for the Camera*

Acting for the Camera is a comprehensive, step-by-step course designed to develop the skills necessary for film, television and commercial work. Throughout the semester, scenes are developed for character analysis and then blocked for camera shots. Students are exposed to and fully utilize the specific techniques required in acting for film, television and commercial work, from learning how to block for camera to developing appropriate acting techniques for the medium.

Prerequisite: None.

Technical Theater 1*

This course is an introduction to production in the upper school performing arts program. Students will have units of study in shop safety and tool use, construction of stock scenery, scenic painting techniques, safe use of counterweight line set systems, theatrical lighting tools and installation, sound system installation and operation, costume design and construction, and property design and construction. The focus of the course will be on production vocabulary and terminology, safety and best practices in all areas of production, and acquisition of skills and knowledge in each of these areas.

Prerequisite: None.

Technical Theater 2*

Harker students will work on all aspects of technical production for our semester two performances, including the upper school dance production, Harker Concert Series performances, choir concerts, orchestra and jazz band concerts, the upper school spring musical, the middle school spring musical and the Senior Showcase performances. Building on the skills acquired in the Study of Technical Theater or Technical Theater 1, this course will be intensely immersive as the students work on: scenery construction, painting and installation, lighting hang and focus, rigging, sound mixing, engineering and recording, costume

and prop design and construction and stage and event management.

Prerequisite: Study of Technical Theater, Technical Theater 1 or instructor's approval. UC approved.

Technical Theater 3*

Students with an interest in design will enjoy this opportunity to hone their skills and learn the process of working collaboratively to achieve their design vision. The class will begin with the fundamentals of stage design and script analysis. We will then be working in coordination with the Student Directed Showcase class to support their work as directors. The goal of the class is for each student to create a design element for one or more of the four Student Directed Showcase shows to be performed in January. The class will focus on collaboration, time management, budgeting and production deadlines. Prerequisite: Technical Theater 2 or instructor's approval.

AP Music Theory

This class is designed to encourage students to discover the meaning of music, by developing their aural, sight-singing, compositional and analytical skills. Basic rudiments are reviewed first, including notation, intervals, scales and keys, chords, metric organization and rhythmic patterns. Students then develop their compositional skills by the creation of two- and four-voice counterpoint. The other major component is analytical, including motivic treatment and harmonic analysis, functional triadic harmony, tonal relationships, modulation and phrase structure.

Prerequisite: Study of Music strongly recommended. UC approved.

Festival Chorus (1 year/0.5 unit)

Any person with a desire to sing in Harker's upper school choirs is welcome in Festival Chorus. Students explore their voices through an exciting array of musical styles while learning and strengthening vocal and musicianship skills. Festival Chorus divides into two smaller ensembles: Rhapsody (tenor and bass voices) and Dolce Voce (soprano and alto voices). There are several performance opportunities throughout the year. The course can be repeated all four years or students can choose to expand their choral experience by auditioning for Harker's upper-level choirs. As an Extra Period Option course, students may take it in addition to their full academic load.

Prerequisite: None.

Cantilena or Capriccio (1 year/0.5 unit)

Known as one of the Bay Area high schools' best treble ensembles, Cantilena consistently garners high marks in festivals for performance and musicianship. Cantilena's repertoire spans diverse times and cultures, from medieval plainchant to 21st-century literature. Solid musicians with strong vocal technique and musicianship who sing in the soprano or alto registers are welcome. Participants: grades 10-12; Selection: by audition; Basic meeting/performance times: Yearlong class. Performances include CMEA festival, two concerts per year, matriculation, baccalaureate, graduation and other events.

Prerequisite: Dolce Voce, Rhapsody or director's approval. UC approved.

Downbeat (1 year/0.5 unit)

Downbeat is an auditioned vocal ensemble that expands on the skills developed in other Harker choirs including musicianship and healthy vocal technique. The majority of the musical pieces studied in this ensemble are a cappella arrangements of pop, jazz and classical repertoire which serve to strengthen students' harmony and ear training skills. The group combines dance and vocal interpretation and provides ample opportunities for solo singing. Downbeat's extensive performance schedule includes Harker events and concerts as well as performances in the larger Bay Area community and at an annual a cappella competition. The discipline and techniques taught in this ensemble prepare students for all aspects of musical life in college and beyond. Participants: grades 10-12; Selection: by audition;

Basic meeting/performance times: Yearlong class. Various performances throughout the year and a holiday tour.

Prerequisite: Dolce Voce, Rhapsody or Cantilena. By audition only for grades 10-12. UC approved.

Conducting Basics*

Conducting Basics covers the kinesthetic, aesthetic, analytical, philosophical and leadership aspects of conducting a music ensemble. The course includes movement and gesture, discrete listening skills, score analysis, rehearsal techniques and materials, and specific aspects of choral and instrumental conducting such as lyric analysis and baton technique. Students will prepare for rehearsal and performance and will have the opportunity to conduct an ensemble the following semester or following year.

Prerequisites: Two years in upper school performing ensemble and concurrent year in performing ensemble. AP Music Theory (previous or concurrent) highly recommended. UC approved.

Arranging and Composing*

Arranging and Composing is a practical class applying concepts learned in Study of Music, Intermediate Musicianship and ensemble classes. Students will analyze arrangements and create their own arrangement for a 4- to 8-part ensemble. They will then create original compositions for soloists or ensembles. Pieces may be showcased at lunch time music jams.

Prerequisites: Study of Music or Intermediate Musicianship Class, or Instructor approval, 1 - 2 years of upper school performing ensemble highly recommended. UC approved.

Basic Vocal Technique and Collaborative Piano*

Basic Vocal Technique and Collaborative Piano is a class geared to the vocalist and collaborative pianist wanting to hone their technique. The class will include repertoire choice; rehearsal and performance techniques; conventions and protocols for performing various styles and genres; soloist and pianist relationship and leadership dynamics; research; musical analysis and interpretation; and physical and mental challenges of performing. A major component of this class is being coached in a supportive environment of teachers and peers.

Prerequisite: For singers and instrumentalists, one to two years of large ensemble experience or instructor approval. For pianists, completion of Level 10 CM or equivalent expertise. UC approved.

Intermediate Musicianship*

A continuation of the basic musicianship concepts of Western music taught in Study of Music, this class covers sight reading, ear training, simple improvisation and pre-AP Music Theory skills. This is a class from which not only choral musicians but musical theater and instrumental musicians would benefit. This class does not substitute for Study of Music.

Prerequisite: None. UC approved.

Lab Band (1 year/0.5 unit)

The Harker Lab Band is an introductory jazz ensemble dedicated to learning the art of large jazz ensemble performance and improvisation. This ensemble is open to all students in grade 9 and those students in grades 10, 11 and 12 who are new to learning jazz. Students who play sax, trumpet, trombone, bass (upright), keyboard, guitar and drums are welcome. The lab band has various performances throughout the year, including the family picnic, homecoming and the Evening of Jazz concert. Yearlong commitment. Open to all grades. Because this is an Extra Period Option course, students may take this course in addition to their full academic loads. The course carries 0.5 credit for a full year of participation.

Prerequisite: None.

Jazz Band (1 year/0.5 unit)

The Harker Jazz Band is the primary vehicle at Harker for the study of jazz and has gained a reputation for its sense of style. It also serves as the Pep Band for athletic and spirit events. Students who play sax, flute, clarinet, trumpet, trombone, bass (electric and upright), keyboard, guitar and percussion are welcome, as are vocalists. The band has various performances throughout the year, including CMEA festivals, Homecoming and two annual concerts. Yearlong commitment. Open to all grades.

Prerequisite: Some auditions may be required for various instruments.

Orchestra (1 year/0.5 unit)

The Harker Orchestra plays a wide variety of musical styles from the great masters of classical music to the cutting edge of contemporary sounds. Participating in a music rich learning environment, orchestra members have the opportunity to work closely with world class guest artists, guest conductors and music specialists who lead sectionals and master classes throughout the school year. Opportunities also exist for musicians to compose, participate in smaller chamber groups, and perform as soloists. The Harker Orchestra has performed in some of the top performance halls throughout the U.S. and Europe. Highlights include tours and performances in Los Angeles, Paris, London, Chicago Symphony Center, and Carnegie Hall in New York City. Performances throughout the year include a holiday show, winter concert, spring concert and graduation. Orchestra is a yearlong commitment and open to all grades.

Prerequisite: Auditions may be required for various instruments.

Performance Practice for Instrumentalists*

Performance Practice is an in-depth course focused on developing musicianship through chamber and solo performances, learning a variety of repertoire, improvisation and composition. While flexibility exists in the curriculum to allow for focus on specific genres to fit student interest, repertoire used in class will span from Baroque to Modern periods in Western music. Students will be introduced to practical techniques designed to 1) improve individual practice, 2) develop meaningful performances, 3) define relationships between improvisation, reading and composition, and 4) assess one's learning. Class projects include composing a cadenza, live performances, and compositions/arrangements for solo and chamber instrumental ensembles. Prerequisite: Open to any student with an intermediate proficiency or higher on any given musical instrument. In some cases, pre-screening and/or department approval may be required.

Prerequisite: None. UC approved.

The Harker Dance Company (1 year/0.5 unit)

The Harker Dance Company is by audition only; selection for troupe membership is based upon the dancers' physical, technical and artistic skills as well as their commitment to a yearlong program of dance study. Stylistic emphasis is on ballet, jazz and modern dance, and the troupes are featured at Harker Day, homecoming and other school events. The annual dance production highlights the talents of the troupes with their original choreography as the focus. Students graduating from this program have gone on to dance in college, citing confidence and skills which enable them to have a competitive edge in college dance programs. As a prerequisite, students must have dance experience and outside studio training. Because The Harker Dance Company is an Extra Period Option course; students may take it in addition to their full academic loads. Company dancers earn 1.5 P.E. credits for the full year of participation.

Prerequisite: By audition only. Auditions are in the spring of every year.

Kinetic Krew (1 year/0.5 unit)

Kinetic Krew is by audition only; selection for troupe membership is based upon the dancers' physical,

technical and artistic skills as well as their commitment to a yearlong program of dance study. Stylistic emphasis is on hip-hop and jazz technique, and the troupe is featured at Harker Day, holiday tour and other school events. Students graduating from this program have gone on to dance in college, citing confidence and skills which enable them to have a competitive edge in college dance programs. As a prerequisite, students must have dance experience and outside studio training. Because Kinetic Krew is an Extra Period Option course, students may take it in addition to their full academic loads. Kinetic Krew dancers earn 1.5 P.E. credits for the full year of participation.

Prerequisite: By audition only. Auditions are in the spring of every year.

Dance Composition*

Dance Composition class is designed for students who wish to learn the basics of how to compose choreography for ensemble performances. The course introduces the basic principles of choreography including inspiration, space and time, dynamics, structure and form, and theme and variation. The course will incorporate learning how to construct group and individual movement improvisations, creating and performing movement phrases, discussion and peer reviews/evaluations, and critical analysis of professional and local dance performances. Students will develop their own choreographic style and voice through broadening and expanding their own movement and choreography vocabulary. The students will experience choreographing in multiple styles of dance. It offers the opportunity to create dance phrases and motifs with instructor and peer critique to ultimately lead to a full-length ensemble piece proposal. Participants: Grades 10-12.

Prerequisite: None.

Choreography* (1 semester/0.5 unit)

Choreography is designed for students who wish to learn how to compose choreography for an ensemble performance. Students will develop their own choreographic styles and voices through broadening and expanding their own movement and choreography vocabularies. The course introduces the basic principles of choreography including inspiration, space and time, dynamics, structure and form, and theme and variation. It offers the opportunity to create dance phrases and motifs with instructor and peer critique, ultimately leading to casting, costuming and designing a full-length ensemble piece to be performed, upon approval, in the Conservatory’s annual dance production. This course will incorporate learning how to construct group and individual movements, improvisations, creating and performing movement phrases, discussion and peer reviews/evaluations, and critical analysis of professional and local dance performances. Students will also learn organizational methods, and experiment with technological advances in the fields of dance and performing arts.

Prerequisite: Completion of Dance Composition and application submission the previous spring.

Visual Arts

The visual arts department offers students a robust and intricate introduction to contemporary art theory and practice. From foundational electives to a senior capstone, students are able to discover and nurture their artistic affinities and creative potential at any level and may choose to investigate several mediums or take a deep dive into a portfolio with intention to study art in college and beyond. The visual arts faculty believes that success in the arts comes from careful looking, hands-on practice, and rigorous development of each student's connection to the greater culture of art production.

Our portfolio programs produce not only excellent work, but work that is driven by the student's research and connections to expression through materials. Instructors work individually with students who are preparing to study art in college to help them develop a portfolio that will excel in the most competitive college programs, and relates each student's unique vision.

The Dickinson Visual Arts Endowment artist residency brings a new practicing contemporary artist each year to work with students and exhibit work on the upper school campus. Students in our classes have the opportunity to work on special projects and engage in work review sessions with each artist-in-residence. Each year the Dickinson artist-in-residence gives a talk, open for the general public, as part of the Harker Speaker Series.

Study of Visual Arts

This survey of visual arts focuses on the artistic production of world cultures as a lens for an exploration and understanding of contemporary art. Through the study of art and artists from the early cave painters to late modern and contemporary practitioners, students will explore art as a mode of expression that unites all of us. Students will consider how changes in science, technology and society trigger new artistic approaches, art movements and cultural ideas. Skill-building lessons in research strategies related to art, art history, and art criticism will support projects exploring sculpture, ceramics, drawing, printmaking, graphic design, photography and more.

Prerequisite: None. UC approved.

VISUAL ARTS ELECTIVES

Foundations: Ceramics*

Ceramics is a course designed to give students the technical and conceptual framework to navigate clay as idea, material and process. As an introductory course, basic methods of construction (pinch, coil, slab, carving, slip-casting, and throwing on the potter's wheel) are utilized to complete projects that are of both functional and non-functional lineage. This class draws from the rich historical tradition and pulls in contemporary sources to generate discussions, provide insight, and contextualize the students' work within the field and from an autobiographical perspective.

Prerequisite: None.

Foundations: Drawing*

This studio class is devoted to the art of drawing from life. The class emphasizes the development of observational drawing skills in black and white media including graphite pencil, charcoal, conté, and Copic markers and ink wash. Students create a portfolio of drawings that explore techniques such as contour, line, value, contrast, shading, texture, blending, perspective, human figure proportions

and composition. Through drawing activities such as rendering still life set-ups, figure studies with a live model, self-portraiture and architectural rendering, students gain personal insight and technical proficiency into the process of drawing realistically.

Prerequisite: None.

Foundations: Graphic Design*

In this course students will focus on building a fundamental platform for understanding how to communicate using visual information. Through a series of projects rooted in the contemporary process of graphic design, students will study composition, color, typography, and digital drawing concepts. The outcome of this course will be a student's increased understanding of both how to create visual works and understand visual communication as a cultural tool.

Prerequisite: None. UC approved.

Foundations: Painting*

This class is a foundation course in the art of painting in the water-based media of acrylic. The study of color theory and composition in painting is an essential component of the course. Painting techniques relevant to this medium will be presented such as color mixing, blending, wet-on-wet, scumbling, gradients, use of gel mediums, expressive brush technique, retinal painting and an introduction to a variety of painting surface preparation techniques. Students will paint from observation, personal imagery, as well as experiment with abstraction. Projects will be developed from still-life arrangements, landscape, figure, personal photographic references, collage and invented compositions.

Prerequisite: None.

Foundations: Photography*

This course provides students with an introduction to photographic concepts, basic image capture, and camera functions with digital cameras. Students engage in a series of creative projects that provide a strong foundation in the hardware, software and techniques associated with digital photographic imaging. Each technical element in this class is paired with an element of contemporary theory that serves as a guiding force for student work. The primary goal of this class is to inform the students' understanding of their roles as image creators in a culture saturated with images.

The course will require some time outside of class for shooting.

Prerequisite: None.

Foundations: Spatial*

In this course, students encounter a range of different approaches to sculpture and industrial design. They will learn to work with malleable, subtractive and constructive materials. This class will study four different aspects of sculpture: malleable materials like clay, wax, and plastic; subtractive materials like wood, plaster and foam; constructive materials like metal, cardboard and wood; and casting techniques for glass, cast pewter, sugar and soap. Students will work with contemporary machines to utilize rapid prototyping skills and computer-based software to create sculptures with the glow forge laser cutter in order to understand the basics of form in industrial design.

Prerequisite: None.

AP Studio Art:

AP Drawing; AP 2-D Art and Design; AP 3-D Art and Design

The AP Studio Art course is a yearlong course that engages students in an introduction to artistic practice and portfolio building. Focused on the intersection of ideas, materials and process as the building blocks of a complete artwork, students will research, iterate and present artworks that engage a topic of their choosing. Students who complete this course will have a substantial portfolio that can be refined for application to college programs.

The entire department works closely with the students in this class on an individual basis to help them develop their artistic skills and talents and guide the preparation of the AP portfolio. Students interested in the course should speak with the department early in the academic year prior to which they intend to take the class in order to ensure adequate preparation.

Prerequisite: Foundations-level course or instructor approval. UC approved.

ADVANCED PORTFOLIO
The Advanced Portfolio courses are intensive investigations intended to empower a student to create a specific and well-articulated portfolio based on their investigation of a medium of their choosing. These courses are intended to be taken after the completion of a Foundations-level or AP Studio Art course, and are for students who want to further develop their relationship with studio art within a rigorous structure.

Advanced Portfolio: Ceramics*

This course builds upon the technical and conceptual approaches. Student-generated research topics unify experiments with more advanced clay and glaze formulation to create a portfolio of ceramic works that address contemporary spatial strategies.

Prerequisite: Foundations: Ceramics or AP Studio Art. UC approved.

Advanced Portfolio: Drawing*

In this advanced class, students build upon the drawing experience and begin experimenting with personal imagery and expressive forms of drawing to build a portfolio. Students address advanced drawing topics including the potential of mark-making, distortion, scale, color harmonies, color blending, collage and mixing media using color pencil, pastel, charcoal, ink wash, markers, gouache and watercolor. Through answering visual prompts, students develop individual drawing solutions and create subject matter and personal expressions to expand their aesthetic skills and theory of drawing.

Prerequisite: Foundations: Drawing or AP Studio Art: Drawing. UC approved.

Advanced Portfolio: Graphic Design*

This course focuses on graphic design as an expressive communication tool. Combining digital illustration, typography and digital photography, students will propose and create complex works that will create an understanding of digital platforms as an evolving art-making strategy, as well as prepare students for their application in professional environments.

Prerequisite: Foundations: Graphic Design or AP Studio 2D Art - Digital Media. UC approved.

Advanced Portfolio: Painting*

Students build on the painting skills and begin investigating new concepts, techniques and approaches to painting in a variety of mediums, including oil. The course addresses more advanced painting topics including creating a series of paintings based on a theme, concept or theoretical framework. Students are encouraged to develop their own visual ideas, subject matter and personal expressions to expand their aesthetic skills in painting.

Prerequisite: Foundations: Painting or AP 2D Art. UC approved.

Advanced Portfolio: Photography*

Through a series of projects based on photographic concepts, students will investigate photography as a cultural language. The emphasis of this course is on building a theory-based photographic process that will allow students to discover their unique way of seeing.

Prerequisite: Foundations: Photography or AP Studio 2D Art. UC approved.

Advanced Portfolio: Spatial*

This course builds on the skills and insights the students acquired in the sculpture class. The students are encouraged to develop and explore ideas that intrigue them on a personal level. The students will learn how to express these ideas using a variety of materials and techniques, emphasizing the development of a broad portfolio. This course will provide the students with the skills needed for the AP 3-D Art & Design course.

Prerequisite: Foundations: Spatial or AP 3-D Art. UC approved.

SPECIAL TOPICS

Special Topics (in 2D, spatial and media arts) is an investigation into an exciting medium not typically offered. Open to all levels, these courses emphasize idea generation through a relationship with a unique set of materials.

Filmmaking: Special Topics in Media Arts*

Students will study the art and technology of time-based media. Scripting and storyboarding, camera techniques, lighting, sound and editing will be applied by students in planning and structuring their own productions. This class will focus on building a foundation for filmmaking as well as a lens for students to interrogate the omnipresence of video in their daily lives. Frequent discussions on the power and role of media in society encourage students to explore the meaning and significance of the moving image.

Prerequisite: None.

Printmaking: Special Topics in 2D Art*

This course introduces students to basic printmaking techniques including relief, collagraph, dry point and monotype printmaking. Using a variety of materials and tools including oil-based inks, brayers, flexi-cut, plexiglass and metal plates, as well as a printing press, students will explore the art of the manually produced and printed image and consider its potential as an individual art practice. This class includes the development and creation of print matrices, editioning processes, and the exploration of personal imagery. Methods related to stenciling, mixed-media, collage and multilayer printing will be addressed. The potential of using the multiple image as a means to explore the evolution and revisioning of ideas will be emphasized.

Prerequisite: None.

Glass: Special Topics in Spatial Art*

This course is an introduction to various processes involved in kiln forming glass - the general term used to describe the various methods employed to shape glass in a kiln using heat. Students will be introduced to kilns, computerized kiln controllers, writing firing programs, annealing, mold making practices, lost wax casting, fusing and slumping processes, cold-working and relevant materials handling skills. Through a series of lectures, demonstrations, and hands-on learning we will examine historical, technical and contemporary practices in studio glass. The ultimate purpose of this class is to introduce students to the material of glass as a vehicle for making art and observing the intersection of glass and contemporary technology in our everyday lives.

Prerequisite: None.

SENIOR CAPSTONE

Honors Art: Directed Portfolio*

For the rare student who has completed AP Studio Art prior to grade 12, this course provides an opportunity for a grade 12 student to develop their art practice with direction and mentorship. This course is anchored by a final solo exhibition in which each student will present a refined set of artworks based on a central concept. Students may choose to take this course twice during their final year.

Prerequisite: Completion of AP Studio Art and submission of portfolio for department approval. UC approved.

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