

# THE MARVELWOOD S C H O O L



## CURRICULUM GUIDE

REVISED JUNE 2019



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#### THE MARVELWOOD SCHOOL ACADEMIC OFFICE

Heather Hunt, Academic Dean • [heather.hunt@marvelwood.org](mailto:heather.hunt@marvelwood.org)

Shannon Nelson, Registrar • [shannon.nelson@marvelwood.org](mailto:shannon.nelson@marvelwood.org)

Tel: (860) 927-0047 Fax: (860) 927-5325

476 Skiff Mountain Road • PO Box 3001 • Kent, Connecticut 06757

[www.marvelwood.org](http://www.marvelwood.org)

# ACADEMIC POLICY

Marvelwood School's guiding principle regarding a student's curriculum is that the goal should be success in a challenging curriculum. As a college preparatory school, we want our students to present well as they apply to colleges, and college admission officers want to see that students have challenged themselves. In other words, successful completion of a high school education is not and should not be based on completing a minimum of required courses or the lowest possible number of credits. Students must exercise good judgment in selecting a course load that is challenging but will not present an overwhelming obstacle to success.

We believe in accommodating abilities, talents, interests and learning styles as much as possible as students progress through the academic program. Some courses are required for graduation, and there is a sequence we normally follow in some subjects. For example, in mathematics, the progression for most students is Algebra I, then Geometry, then Algebra II, and then Trigonometry or Precalculus. In science most freshmen take Biology I, and most sophomores take Biology II. In history most juniors take U.S. History.

All academic classes at Marvelwood are yearlong courses. Arts and elective courses are offered by the term, but many may be taken for one, two, or three terms. At the start of each term, students are given a window of opportunity to change non-mandatory classes or elective choices with advice from the Academic Dean. Misplacements can be addressed by the Academic Dean at any point during the course of the year, but class changes are typically made during the first weeks of school or at the beginning of a term.

## COURSE LEVELS

Marvelwood's faculty are adept at challenging all students at an appropriate level, and are able to accommodate students of all abilities in mainstream classes. As such, course leveling does not apply at Marvelwood. Honors-level curriculum is offered in 10th, 11th and 12th-grade courses. In this handbook, classes which are or may be offered at the Honors level are indicated with an asterisk (\*).

In some other junior and senior courses, honors credit may be awarded to individual students who excel in the classwork; this credit is awarded at the discretion of the instructor and the Academic Dean. Courses in which discretionary Honors credit may be available are indicated with a double asterisk (\*\*).

## REQUIREMENTS FOR GRADUATION

A minimum of twenty-four (24) academic credits is required for graduation. The following are the minimum number of academic credits required for graduation from Marvelwood:

- 4 credits in English, grades 9 – 12
- 4 credits in mathematics, grades 9 – 12, including Geometry and Algebra 2<sup>°</sup>
- 3 credits in history, including U.S. History
- 3 credits in science, including two lab sciences
- 2 credits in world languages<sup>°</sup>
- 3 credits in the arts

Please note that this list comprises the minimum expectations in all areas. The vast majority of our students graduate having earned more than the minimum number of credits and/or completed more than the minimum requirements in each academic area.

Students take six to seven courses each year. Juniors and seniors may elect a supervised study period in place of an elective as long as they are carrying a minimum course load of five year-long academic classes, not including a Learning Support class.

<sup>°</sup> In some cases of a diagnosed learning difference in language or mathematics, the world language requirement or fourth credit in mathematics may be waived.

# THE ARTS

Art is a universal language that is fundamental to a complete education. Through exploring the arts, students often develop a deeper understanding of the human experience, one that enriches their lives as adults. The arts program at Marvelwood is built on a proud tradition of artistic expression that stretches back to the School's founding. The study of the arts teaches our students analytical and creative thinking, problem solving, project-based learning, collaboration, communication, global perspective, non-traditional assessment, and arts literacy. The Arts Department presents arts exhibitions, instrumental and vocal concerts and recitals, and musicals and plays throughout the year.

Because of the School's proximity to New York City, New Haven, Hartford, and Boston, students have the opportunity to visit major museums and galleries, attend dance and music concerts, musicals, and plays. In addition, the Arts Department offers master classes and workshops with guest artists in all fields.

Arts courses are offered by the term, but many may be taken for one, two or three terms. It is expected that a student who enrolls in an Advanced or Honors arts class will remain in the class for the full year. A minimum of three credits in the arts is required for graduation. Not all courses listed are offered every term or every year.

## THE VISUAL ARTS

### **STUDIO ART – All grades**

This course introduces students to the fundamentals of studio art as it pertains to drawing and painting. Using innovative studio projects and a rich variety of media, students explore the elements of art and design (balance, composition, line, contrast, shape, color, size, space, form, value, texture, unity/harmony, pattern, emphasis, movement) through drawing and painting from life, photographs and the imagination. Through class critiques and discussions around established art works, students learn how to discern and discuss pictures, understand their meaning, and develop an understanding of art as a means of communication and social commentary. Each student practices drawing multiples of a given subject matter (still lifes, landscapes, portraits, figure drawing, anatomy, etc.) while using a variety of media (colored pencil, charcoal, conte crayon, India ink, pastel, paint markers) and practices painting techniques using watercolor and acrylic on canvas. The course is designed to encourage self-expression and develop skills for creative problem-solving.

### **ADVANCED ART – 11<sup>th</sup> & 12<sup>th</sup> grades\***

Advanced Art is a course for students who demonstrate an exceptional work ethic in Studio Art, and have a strong interest in continuing their art education in college. Advanced Art students receive guidance in the development of college portfolios for application to art schools and further studies. Prior experience in drawing and painting is required, and students must obtain the instructor's permission to enroll.

### **PHOTOGRAPHY – All grades**

This class is designed to teach students how to use digital cameras, scanners, imaging software, printers and computers to explore the artistic potential of new imaging technology. Students will learn how to plan and produce digital images that demonstrate an understanding of composition, light, color and visual impact. Hands-on projects include digital painting, digital photography, image capture, image manipulation and graphic design ideas. Students will experiment with digital cameras and many editing tools in both Photoshop and Adobe Illustrator. The intention of these assignments is to approach the tools as a process so that students can learn how they operate and begin to manipulate them towards their own creative ideas. Approaches to scanning and printing will also be taught. The school maintains a photography blog where student work is displayed and critiqued.

### **FILM STUDIES – All grades**

Film Studies introduces students to the basics of film production and analysis. Students will view scenes from iconic movies and develop the ability to identify and discuss various filmmaking techniques and their purposes. Each student will participate in the development, writing and filming of a short film; the collaborative creative assignment will encourage students to work together and problem-solve as a team, offer constructive criticism, and create a final piece that they can show to the school and submit to various student film competitions. Film Studies students will also have the opportunity to attend film festival awards events to be recognized for their work and view films created by students from other schools. The course is designed to encourage self-expression and creativity, and to teach the fundamentals of visual storytelling.

### **YEARBOOK – 11<sup>th</sup> & 12<sup>th</sup> grades**

This course focuses on all aspects of putting together Marvelwood's yearbook, including choosing a theme, setting a meeting project deadlines; taking pictures and manipulating them using computers; layout and editing of pages; and funding the project through solicitation of advertising. Students will become skilled in the use of 35mm cameras and developing equipment, and will

learn graphic design using computers. Some knowledge of basic photography is helpful but not required. Most students enroll in this class in the fall and remain for two or three terms to work on all phases of preparing the yearbook.

### **CERAMICS – All grades**

Ceramics is a fine arts course of study that consists of technical skill-based exercises and creative problem-solving assignments. Ceramics includes anything made in clay. In addition to handbuilding functional ware such as cups, plates and bowls, students also explore large sculptural pieces as well as learn how to use the potter's wheel. Students learn the limitations of the clay—thick pieces explode in the kiln, flat things tend to curl in drying, thin pieces break easily when dry—so their designs must take these facts into account. Students are required to make a series of projects each term, based on their level of expertise. Emphasis is on continually practicing and building skills. This is a studio-based class involving the use of messy materials, so be prepared to wear aprons or bring clay clothes!

### **3D ART – All grades**

In this one-term elective course, students study 3D design utilizing LEGO bricks as the medium with which to create their art. They learn how to design models with a digital design computer program and are given the opportunity to express themselves through real, personal creations. A unit on architectural design allows students to study real architecture and learn how to make a scale model of a specific building such as the Eiffel Tower, the Empire State Building or the Leaning Tower of Pisa. Once a week, there is a fun “design challenge” activity, and plenty of time is allotted for work on independent projects. Ultimately, the students will gain valuable skills that will enhance their knowledge and understanding of art, architecture and design.

## **THE PERFORMING ARTS**

### **GENERAL MUSIC – All grades**

This course offers music instruction for each student based upon his/her own individual music ability. Students will learn basic music theory, musicianship, and other tools to further grow their education in music. This course provides students an opportunity to participate in an ensemble setting, regardless of ability or previous training, and gives students the opportunity for instruction on pitched instruments (including voice) of their choosing. No experience or skill is necessary to enroll, but a music performance is a required part of the course.

### **BEGINNING PIANO – All grades**

The objective of this course is to give the student a beginning foundation of the skills necessary for basic piano playing, including reading and understanding music. Students will practice reading traditional music notation, tabs, and chord sheets from songs currently heard on the radio. No experience or skill is necessary to enroll, and no public music performance is required.

### **INTERMEDIATE PIANO – All grades**

The objective of this course is to expand the ability level of beginning pianists. Students will continue a basic study of music theory and notation, practicing reading traditional music notation, tabs, and chord sheets from current popular music of today. Students need to have to have a strong foundation in piano, including reading treble and bass clef and using two hands independently, in order to enroll at this level. A final public music performance is required. This class is not for advanced pianists.

### **STUDIO VOICE CLASS – All grades**

Students in the Studio Voice class will learn appropriate vocal technique, music theory, and elements of music history. Students will be given the opportunity to sing in an ensemble and work with ensemble music. They will also be able to bring solos into the class, and learn how to break them down musically and artistically. The course is geared to meet each musician wherever they are in terms of talent and ability. We believe that all students who want to sing will be able to learn to sing to some degree.

### **ADVANCED MUSIC – All grades**

This course combines practicing one instrument per term, studying intermediate to advanced music theory, playing or singing in an in-class ensemble, and music appreciation into one year-long course. The class is designed for students who wish to be challenged as musicians. Those interested in enrolling must demonstrate the ability to play an instrument or sing at an intermediate level or higher. *Students interested in Advanced Music should enroll in the fall term and will be encouraged to remain for the full year.*

### **MUSIC THEORY & SONGWRITING – All grades**

This course analyzes how modern composers write the music we hear every day on Spotify or Apple Music. Students will analyze the notation, chord structure, and cadences of popular music as they work toward a final compositional project of their own. Students must be able to play piano or guitar, but an ability or interest in singing is not a requirement of this class.

**SONGWRITING – All grades**

Songwriting is the art of crafting music together with lyrics. In contemporary and popular culture, songs “fuel desire, inspire hope, break hearts, rock worlds, unite people, shake booties, turn blahs into blues, and almost always make us feel good... all in a few minutes” (Gotham Writers Workshop). The course introduces the student to traditional song structure, like the time-tested 8/16 bar phrase and its many variations, and to the challenges of lyric writing. Students study dozens of classic hits as examples of successful songs, regardless of style or genre, and the age-old question each poses: which came first, the words or the music? Working individually or in small groups, students compose and record their original songs on digital formats like *Pro Tools* or *Garage Band*. They will also have the opportunity to perform their songs at Music on the Mountain, the school’s open mic show. As a reference, the course uses *Tunesmith, Inside the Art of Songwriting* by Jimmy Webb, multi-Grammy winner and one of the most celebrated composers of our time. Basic proficiency in either piano or guitar is required. Some knowledge of music theory and notation is a plus but is not necessary. Class size is restricted, and grades are based solely on effort and passion for the craft!

**INTRODUCTION TO THEATRE – All grades**

This course surveys the art of the theatre with emphasis on the role of the playwright, director, actor, designer, and producer. It promotes the development of college-level writing, reading, listening and speaking skills.

**CHARACTERIZATION: ACTING LAB – All grades**

Acting Lab is a fun, process-based class in which students explore the multiple facets of theatre, drama, and imagination play. By collaborating to create original theatrical scenes, playing theatre games to promote ensemble work, exploring mediums such as puppetry, mask, and improvisation, practicing voice exercises and learning natural acting and character creation, students will be immersed in the full “theatre experience.”

**HONORS THEATRE – 10<sup>th</sup>, 11<sup>th</sup> & 12<sup>th</sup> grades\***

A program of rigorous academic studies for advanced students who want to hone their acting skills through use of critical thinking, research, writing and oral presentation. We begin the year studying theatre in ancient Greece, including the plays Oedipus Rex and Lysistrata. This class will work on different styles of acting through an examination of plays by Shakespeare, Oscar Wilde, Noel Coward and Lorraine Hansberry.

# ENGLISH

The goals of Marvelwood School's English department are to teach students to use literature to understand the world and themselves, and to help them articulate their thoughts clearly, both orally and in writing. Our sequence of courses and thoughtful curricular choices engage and challenge students and foster an increasingly sophisticated command of both language and literature. Student-centered classes incorporate the development of writing skills, including vocabulary and grammar. Teachers think creatively and plan strategically to accommodate a variety of learning styles. Small class size provides an environment for lively, discussion-based learning, out of which come new possibilities for thinking about the world and each other.

Four credits in English (one at each grade level) are required for graduation. During the four years of English, students are guided toward more rigorous critical and analytic reading through exposure to increasingly complex texts. The aim is to allow students to become more confident in their writing abilities as their familiarity with the writing process deepens.

Summer reading is required at all grade levels.

## ENGLISH 9 – 9<sup>th</sup> grade

English 9 builds competency in high school-level critical reading skills as well as paragraph writing, grammar and punctuation. Students will be guided through classroom discussions and inquiries of thematic topics presented in a variety of literature from major genres. Written assignments include persuasive, narrative, expository and descriptive essays as well as journaling and poetry writing. Students complete activities that challenge their writing, analytical and interpretive skills and help to build and strengthen their academic English vocabulary.

Recent core texts and units have included *Romeo and Juliet*; *All American Boys*; *Animal Farm*; *The Complete Tales and Poems of Edgar Allan Poe*; short stories by Ernest Hemingway; *D'Aulaires' Book of Greek Myths*; *To Kill a Mockingbird*

## ENGLISH 10 – 10<sup>th</sup> grade\*

The primary objective in English 10 is to firmly ground students in critical reading, writing, and thinking skills. Students are asked to analyze the concepts found in the daily readings through writing assignments and class discussion. Utilizing short stories, novels, plays and poetry, students look critically at the elements of literature. They attempt to master general grammatical skills, while essay development entails proper sentence, individual paragraph, and multiple-paragraph construction. Discussion and writing assignments are taken from the reading assignments and related films.

Recent core texts and units have included *Othello*; *The Catcher in the Rye*; *Sir Gawain and the Green Knight*; *Lord of the Flies*; *Things Fall Apart*; *Brave New World*; *Frankenstein*; *Persepolis*; *Ender's Game*

## ENGLISH 11 – 11<sup>th</sup> grade\*

English 11 familiarizes students with major texts from the traditional canon of American literature. Landmark works are studied for their own merits and for their place in American history and culture. In-class presentations develop public speaking skills. Students also learn to make margin notes in their books. Some class time is devoted to vocabulary development and SAT preparation. Organizational skills such as outlining practice and word-processing competence are a high priority.

Recent core tests and units have included *The Crucible*; *Death of a Salesman*; *Into the Wild*; *O Pioneers!*; *The Great Gatsby*; *Slaughterhouse Five*; poetry by Robert Frost and Maya Angelou; short stories of Edgar Allan Poe and Nathaniel Hawthorne; *Flowers for Algernon*; *The Glass Menagerie*; *Of Mice and Men*; the *March* trilogy

## ENGLISH 12 – 12<sup>th</sup> grade\*

English 12 seeks to fine-tune students' critical reading, writing, and thinking skills in preparation for college or other post-high school endeavors. The principal thrust of the senior year, the study of complex works of literature, involves an intense focus on thematic development, imagery and symbolism, and the relationship of the work to a broader social and political context. The course is characterized by a heavy workload in reading and frequent essays in which students critically engage with the themes developed in the readings. Students are expected to actively participate in a discussion-based classroom setting, to take effective notes in class and while reading, and to improve their ability to write at the college level. Some attention is paid to SAT preparation involving vocabulary and reading comprehension practice.

Recent core texts and units have included *Hamlet*; *Equus*; *The Elephant Man*; *The Picture of Dorian Gray*; *Legends of the Fall*; *A Farewell to Arms*; *The Metamorphosis*; short stories of Albert Camus, J.D. Salinger, and Ernest Hemingway; *The Norton Anthology of Short Fiction*

# ENGLISH AS A SECOND LANGUAGE (ESL)

The Marvelwood School's English as a Second Language (ESL) Program is designed to support international students in their efforts to gain a solid foundation in the structure, vocabulary, and nuances of the English language and to ensure that they become comfortable and confident in communicating with others in English. The program facilitates appropriate placement for students with varying degrees of proficiency. Each individual student and every year's group are unique; therefore, teachers in the ESL department creatively and thoughtfully tailor their curricula to meet the specific needs of the students at each level. Small, student-centered classes enable English language learners to develop their confidence through targeted skills-building and interactive activities as well as content-based programming. Our unique location allows international students the opportunity to learn about and explore American culture through field trips to diverse locations including a Native American Museum, colonial Sturbridge Village, New York City, Cape Cod and Boston. In addition, Marvelwood is licensed as a TOEFL (Test of English as a Foreign Language) testing center, making this quantitative measure of fluency easily accessible to our students. Our goal is for students to gain sufficient mastery so that they can successfully transition to a fully mainstreamed academic program before graduation. Working creatively, energetically and empathetically with young adults who are far from home, we embrace opportunities to celebrate the rich cultural diversity represented on campus. We also hope to ignite a flame within each student and motivate them to be independent, life-long learners.

Summer reading is required of all international students.

## **ESL 1 – LOW-INTERMEDIATE PROFICIENCY**

Students at this level have typically been studying English for several years and are beginning to understand the language but can only use it in a limited capacity. In this intensive level, students are enrolled in four ESL classes a day: two English language courses, a US history course, and ESL Biology. These classes focus on reading comprehension, vocabulary development, and building everyday language skills. Literature study includes fables, simple short stories and simplified novels. The writing component focuses on fluency and form. Students are encouraged to express themselves in writing by communicating their thoughts and experiences in journal writing, literature responses and other exercises. Furthermore, conversational practice engages students in lively interactions based on real-life situations.

## **ESL 2 – INTERMEDIATE PROFICIENCY**

Students at this level can generally understand the meaning of a commonplace conversation involving fluent speakers, and can make relevant contributions and obtain information from others by asking questions. At this level, students are enrolled in two or three ESL classes a day depending on their need. Literature study involves short stories and novels. Students are introduced to more advanced literary devices such as simile, irony, vivid imagery and metaphors, and complete a variety of writing assignments that focus on paragraph development, writing strong topic sentences, and constructing coherent paragraphs with clear main ideas and supporting details.

## **ESL 3 – ADVANCED PROFICIENCY**

Students at the advanced level are nearly ready to be completely mainstreamed but need to fine-tune their reading and writing skills before joining a mainstream English class. Advanced speakers are enrolled in one to two classes at this level, which serves as their English course for the year. Students read and analyze different challenging texts and write articles, reports and critiques. They develop analytical and argumentative strategies to explain and defend their ideas and opinions effectively. Writing activities include comparing and contrasting, describing, and analyzing cause and effect in a polished five-paragraph format. Research paper assignments reinforce guidelines for citing, paraphrasing, quoting and documenting sources.

## **FUNDAMENTALS OF ENGLISH**

This transitional course offers international students the opportunity to strengthen or brush up on their emerging or pre-existing English language skills before moving into mainstream English classes. Writing, speaking and listening skills are combined to allow students to gain a solid base from which to continue their studies. Students engage in role-playing activities and listening labs which further their communication skills and enable them to acquire important vocabulary. Fiction and nonfiction articles and books are read in class, and writer response journals are developed over the course of each term. This class is offered as needed/appropriate from year to year.



# HISTORY

The Marvelwood School's History department is committed to providing students with an understanding of the lessons of history so that they may comprehend, evaluate, and appreciate the triumphs and mistakes of our ancestors. The study of history offers concrete knowledge of past events as well as the opportunity to examine the role of humans in shaping and reacting to complex transformational periods. The History curriculum is designed to promote and encourage intellectual curiosity and a diversity of viewpoints. Faculty employ a wide variety of teaching methods to support learners of all abilities, enabling each student to combine effort with imagination in working to achieve success or even to surpass their own expectations. Our overarching goal is to help students become forward-looking individuals who are equipped with the knowledge, perspective, and motivation to reflect upon their own actions, beliefs and choices within a broader context.

Three credits in History, including U.S. History, are required. Most students take four years of history, and some even enroll in two history classes in the senior year. All freshmen are enrolled in World History 1, and, with few exceptions, sophomores are enrolled in World History II. All juniors take U.S. History unless they arrive at Marvelwood with a full year's U.S. History credit from another school. Seniors have several class options if they choose to pursue history in their final year of high school. Not all courses listed are offered every year.

## **WORLD HISTORY 1 – 9<sup>th</sup> grade**

This course introduces freshmen to cultures and civilizations that are different from their own. It covers world history from the origins of primitive cultures through early Medieval Europe. A primary goal of this course is to instill appreciation for the diverse world in which we live so that students can develop the cultural awareness needed to get along with all types of people. What culture is, the way it can act to promote prejudice, and the ingredients that go into making a civilization are core concepts. Teaching is pursued in a hands-on manner; drawing artifacts, taking field trips, cooking, looking at visual images, and writing both imaginative first-person accounts and personal opinions are all methods which are employed in an effort to make distant cultures come alive. Furthermore, studying peoples with distinctive mores, such as the Australian aborigines, ancient Chinese thinkers and medieval peasants, prompts students to make vivid comparisons to their own lives, and to see themselves more clearly. Document-based questioning and the research paper writing process are also introduced. This course is required of 9<sup>th</sup> graders.

## **WORLD HISTORY 2 – 10<sup>th</sup>, 11<sup>th</sup> & 12<sup>th</sup> grades\***

This course introduces sophomores to what history is and to the chronological sequencing of events that embody cause and effect. Starting with early Medieval Europe in the 1400's, the course covers the major civilizations in Europe, Africa, Mesoamerica and Asia to the World Wars. The component parts of these civilizations, their vitality and collision with other civilizations are core concepts. Every effort is made to bring these worlds to life. Towards this end, maps, videos, field trips, imaginative writing, opinion writing, music and art history are utilized extensively. Document-based questioning and the research paper writing process are continued in this course. Students are expected to expand their ability to handle abstract concepts and to digest information. This course is required of 10<sup>th</sup> graders and may be taken as an elective history class in the 11<sup>th</sup> or 12<sup>th</sup> grade.

## **U.S. HISTORY (*Required*) – 11<sup>th</sup> grade**

United States history covers events from the discovery of the Americas to the present day. Some of the topics are Colonial America, the Revolutionary War, the Constitution, slavery and the Civil War, Westward Expansion, the Gilded Age, reform movements, and the twentieth century. The goals of the course are to educate students on the history of America and to emphasize the ideas of citizenship, the law, and how these concepts apply to their own lives. Text readings are supplemented by outside primary and secondary sources and the screening of both documentary and feature films. Document-based questioning and the research paper writing process are continued in this course. This course is required of all students by the end of the eleventh grade.

## **AP U.S. HISTORY – 11<sup>th</sup> & 12<sup>th</sup> grades\***

This course covers U.S. History from the discovery of the Americas to the present day but at a much faster pace and in more depth than the Level II course. Class time is also devoted to preparing students to excel at the multiple-choice problems, the document-based questions, and the thematic questions posed on the Advanced Placement exam which all students take in May. At the end of the year students research and write a five-page research paper similar to what will be required in a freshman college class. Permission of the instructor is required for enrollment.

## **AP EUROPEAN HISTORY – 12<sup>th</sup> grade\***

This course is designed to prepare students for college history classes. The course surveys European history from 1492 to the present day and covers such topics as the Renaissance, the Wars of Religion, the Enlightenment, the French Revolution, the Napoleonic Era, the Industrial Revolution, the rise of Communism, the establishment of modern nation-states, the Russian

Revolution, and both World Wars. The curriculum focuses on reading and writing skills and draws from the text and numerous outside primary and secondary sources. At the end of the year students research and write a five-page research paper similar to what will be required in a freshman college class. Class lectures and debates are supplemented by screenings of both documentary and feature films. Students take the AP exam in May.

#### **AP ECONOMICS – 11<sup>th</sup> & 12<sup>th</sup> grades\***

This course is designed to prepare students to take the AP exam in Microeconomics. The course gives students a thorough understanding of the principles of economics that apply to the functions of individual decision makers, both consumers and producers, within the economic system. Topics in Microeconomics include opportunity cost and trade-off, supply and demand models, consumer choices, production and costs, and theory of firms. This course also covers market structures such as oligopoly, monopoly and monopolistic competition, and perfect competition. Students also study the analysis of labor markets and the effectiveness of government policies to correct market failures and achieve economic efficiency. Additionally, students are introduced to the principles of macroeconomic behavior of the economy as a whole, especially for a national economy. Topics in Macroeconomics include aggregate supply and aggregate demand, and market equilibrium. The course also covers economic performance and growth, fiscal policy, money and banking, the Federal Reserve System, monetary policy and international trade. Students are expected to use graphs to analyze economics applications and develop critical thinking skills to understand the fundamental concepts. Students will also learn about entrepreneurship and applications of economics in real life through a self-designed project. Students are required to take the AP Microeconomics exam, and may choose to take the AP Macroeconomics exam as well, provided they are willing to do extra work and study independently outside of class in order to prepare.

#### **COMPARATIVE POLITICS & INTERNATIONAL RELATIONS – 11<sup>th</sup> & 12<sup>th</sup> grades\*\***

This course is designed to introduce students to the study of world politics. The first part of the course examines a variety of political regimes as represented in China, Great Britain, Iran, Mexico, Nigeria and Russia. These countries' political, governmental, economic, and social structures will be compared and analyzed in depth. The second part of the course focuses on the theoretical concepts that international relations specialists use in analyzing world events. Areas of inquiry include: How do relations between international entities take place, and on what basis? Is the world a place where countries can cooperate, or must they compete with each other for dominance? Will the nation-state survive in the future? Can the international community work together to protect the environment? This class will prepare motivated students for college-level coursework in political science.

#### **HISTORY OF THE MIDDLE EAST – 11<sup>th</sup> & 12<sup>th</sup> grades\*\***

The Middle East has played a significant role in ancient, medieval and modern world history, and has held a central place in diplomatic, military and economic developments for the West since the middle of the 20th century. This yearlong course will help students to gain a clearer understanding of this complex region and to chart the roots of the wars and revolutions that have spread across the Middle East in the 21st century. Using a variety of primary print sources as well as a sampling of news programs, documentaries and other films, we will examine a wide range of topics including the birth of Islam as a world religion, the history of the Crusades, the rise and fall of the Ottoman Empire, World War I and its consequences, the Arab/Israeli conflict, the Iranian Revolution, the Iraq War, Arab Spring and the rise of the Islamic state, and the collapse of the Arab states since 2010. Several short papers will be assigned each term; class participation in debate is a significant requirement of the course, which will culminate in a research paper.

*Marvelwood may run an honors-level version of this course in 2019-2020. The Honors Middle East History class would follow the same basic format but would move faster to cover more material, and would include more reflection papers, debates, and examination of alternate and collaborative sources.*

#### **RELIGION – 11<sup>th</sup> & 12<sup>th</sup> grades**

Covering both western and non-western religions, this course introduces students to the philosophical ideas underlying religious beliefs and how they have affected the course of history. The curriculum raises questions concerning cosmology, eschatology and ethics. Students are required to read a number of challenging texts and to follow fact-filled lectures utilizing lecture notes. Developing both reading and listening skills is a large component of the course. Extensive classroom discussions allow students to verbalize their thoughts and feelings on a number of meaningful topics. These elements, along with writing the required term papers, are excellent preparation for college-level history classes. The course also instills a deeper understanding of the world's religions and each student's own personal religious beliefs.

#### **AMERICAN MUSIC HISTORY – 11<sup>th</sup> & 12<sup>th</sup> grades**

This course introduces students to a variety of genres of American music in the context of the time period in which each was created. Using audio, video, and reading selections, students examine the cultural and social impact of American music and music-makers. Topics covered include early jazz, blues, gospel, protest music, rock and roll, funk, rap, and hip-hop. Each term culminates in a project in which students discuss the aesthetics and social importance of a particular musical movement or figure. Students will build an understanding of how music is a mirror of the time in which it is created. *This class is open to seniors and to juniors who have completed US History or who would like to take the class in addition to US History. Space permitting, interested 10<sup>th</sup> graders may be given permission to take this class in addition to World History 2. The class may also be offered in the format of term-long electives; see the "Arts" section of this Guide for more information.*

# MATHEMATICS

Marvelwood School's Mathematics department provides a supportive environment for students to learn increasingly sophisticated mathematical skills and applications. We encourage the development of students as analytical thinkers, enabling them to become life-long learners. Students are challenged to connect fundamental concepts to practical real-world applications, and have access to resources, including technology, that support the development of mathematical curiosity. Teachers are committed to meeting the needs of all students and provide instruction and extra help at all levels, from one-on-one remediation to Advanced Placement preparation. We meet students where they are and help them get to where they need to go.

Four years of mathematics study are required, including Geometry and Algebra 2. Varying levels of ability are accommodated through course levels and consideration of each student's math background and demonstrated skill level when determining appropriate course placement. Various teaching methodologies are used in order to interest the anxious math students as well as challenge those students capable of advanced work at an accelerated pace. Wherever possible, emphasis is placed on everyday use and real-world applications of mathematical concepts. Calculator use is required at all levels. For Algebra 2 classes and beyond, students must use the TI 83+ (and above) graphing calculator. Not all courses listed are offered every year.

## **PRINCIPLES OF ALGEBRA – 9th & 10th grades**

This is a course designed for students not yet ready to enter the mainstream mathematics course sequence. The class reviews basic math skills such as telling time, counting money, multiplication tables, and working with whole numbers and fractions. Students in this class may move on to Prealgebra, Algebra 1 or a math tutorial.

## **PREALGEBRA – 9th grade**

This course is for students not yet ready to take Algebra 1. The curriculum consists of a more intensive review of arithmetic skills than that offered in Algebra 1, with emphasis on fractions and decimals. Once basic math skills are firmly in place, the course moves on to a study of algebraic concepts, such as real numbers and integers, number lines, recognizing constants and variables, and equations and inequalities with one and two variables. At the end of the course, some students may be ready to move on to geometry, but most will continue on to Algebra 1.

## **ALGEBRA 1 – 9th & 10th grades**

After a review of basic arithmetic and prealgebra skills, students are introduced to the basic rules of algebra, including recognizing constants and variables, number lines, exponents, equations and inequalities with one and two variables, factoring polynomials, and linear equations and their graphs. The basics of the TI83+ calculator are introduced. Students move on to Geometry the following year.

## **GEOMETRY (*Required*) – All grades\***

This course covers the essentials of planar and three-dimensional geometry. Topics include figures and constructions, congruence, similarity, trigonometry, and area and volume. At the honors level, deductive reasoning and formal proofs deepen the properties of figures studied. At both levels, hands-on learning is encouraged and students explore real-world applications of geometry. This required course helps to prepare students for the math sections of both the SAT and ACT. From Geometry, students typically move on to Algebra 2.

## **APPLICATIONS OF ALGEBRA – All grades**

This course focuses on the algebraic skills necessary to navigate real-life scenarios such as budgeting, price comparison, checkbook balancing, calculating taxes relating to salary and purchases, calculating tips, and determining interest paid on loans and credit cards. Students will also focus on how to consider the environment in their role as a consumer, as calculating the impact of the production and sustainability of a product plays a big role in determining the value of a purchase. We also focus on long-term financial planning, the difference between "good debt" and "bad debt," and saving and investing.

## **ALGEBRA 2 (*Required*) – 10th, 11th & 12th grades\***

The course develops students' skills in solving complex algebraic problems. Topics include inequalities, linear and quadratic equations, analytic geometry, and graphing parabolas, circles, ellipses and other geometric shapes. All levels work on polynomials, factoring, and simultaneous equations. To prepare students for Precalculus, the higher-level class introduces advanced topics including logarithmic functions, number theory, functions, coordinate geometry and trigonometry. Advanced use of the TI83+ graphing calculator is part of the coursework at all levels. Depending on their ability and their achievement for the year, students move on to either Trigonometry or Precalculus.

**TRIGONOMETRY – 10<sup>th</sup>, 11<sup>th</sup> & 12<sup>th</sup> grades**

This course is designed for the student who needs to further develop skills in advanced algebra, analytic geometry and trigonometry in preparation for a study of advanced mathematics. Graphing, solving complex equations, and trigonometry are the main topics of study. A year's credit in Algebra 2 is required for enrollment in this course. From Trigonometry, students move on to Precalculus or Calculus.

**PRECALCULUS – 11<sup>th</sup> & 12<sup>th</sup> grades\***

Precalculus is designed to develop and refine the tools required for the study of calculus. Topics covered include functions and their graphs; polynomial and rational functions; complex numbers; exponential and logarithmic functions; trigonometry; trigonometric functions; and analytic trigonometry. Other topics may include systems of equations and inequalities and analytic geometry. The ability level of students in each class section will determine what is actually covered. Students move on to Calculus, AP Calculus AB or Statistics.

**CALCULUS – 11<sup>th</sup> & 12<sup>th</sup> grades\***

This course covers most aspects of differential and integral calculus. Topics include limits, derivatives, applications of differentiation, differential equations, integration, applications of integration, and transcendental functions. Applications in business, economics and the sciences are used to reinforce the students' understanding and appreciation of the subject.

**STATISTICS / AP STATISTICS – 12<sup>th</sup> grade\***

This project-based course introduces students to the study of statistics and its use in a wide variety of real-world areas and applications. Course material includes graphing aggregate data, making histograms, creating quartile ranges, probability and statistical inference. During each unit, students will plan and conduct statistical studies and experiments. While project-based, the course covers all topics required for students who are interested in taking the Advanced Placement exam in Statistics in the spring. Students interested in pursuing AP credit for this course must formally declare their intention by the end of the fall term, must take the AP exam, and will be expected to complete additional work and/or to attend supplementary instructional time geared toward more in-depth exploration of the topics in preparation for the exam. Students must have completed a full year's credit in Algebra 2; it is strongly suggested that the student finish or be concurrently taking Precalculus before enrolling in this course.

**AP CALCULUS AB – 11<sup>th</sup> & 12<sup>th</sup> grades\***

This course covers most aspects of differential and integral calculus. Topics include limits, derivatives, applications of differentiation, differential equations, integration, applications of integration, and transcendental functions. Applications in business, economics and the sciences are used to reinforce the students' understanding and appreciation of the subject. The course prepares students for the AP Calculus AB examination in early May, which students must take to earn credit at the AP level. A full credit in Precalculus and permission of the instructor are required for enrollment in this advanced-level class.

**AP CALCULUS BC – 11<sup>th</sup> & 12<sup>th</sup> grades\***

This course is a continuation of the AP Calculus AB course. Students review the previous material and go on to address more complex topics in calculus, including infinite series, parametric equations, polar equations, integration by parts, partial fractions, and improper integrals. The course prepares students for the AP Calculus BC examination in early May, which students must take to earn credit at the AP level. A full credit in AP Calculus AB and permission of the instructor are required for enrollment.

**DIFFERENTIAL EQUATIONS – 12<sup>th</sup> grade\***

This course is offered to advanced students who have completed the school's other upper-level mathematics classes. Throughout the year, we will cover a variety of topics in differential equations. Each term will also include a math modeling project, which will involve math writing; the written work will involve research, some programming and modeling, and effectively explaining in writing the mathematical models and techniques used in the project. Sample projects might include modeling forest fires or simple harmonic motion, and using differential equations as a means to effectively explain the model.

**MULTIVARIABLE CALCULUS – 12<sup>th</sup> grade\***

Multivariable Calculus is a one-year course designed for students who have already successfully completed AP Calculus AB or preferably BC. Students will extend their knowledge of limits, continuity, differentiation, integration, and their applications to higher dimensions. The course covers topics including vectors and geometry of space, vector-valued functions, functions of several variables, multiple integration, and vector analysis.

**COMPUTER SCIENCE: PROGRAMMING – 10<sup>th</sup>, 11<sup>th</sup> & 12<sup>th</sup> grades**

This class introduces students to what it takes to create real-world, working computer programs. It covers three topics in programming: HTML/JavaScript, Visual Basic and Visual C#. HTML/JavaScript is the language of the web. We cover the basics of web page design by examining the Hypertext Markup Language (HTML) used in every single page the students visit while surfing the web. The basics of the HTML and JavaScript languages are covered, empowering students to build their own web sites and giving their pages real programming functionality. The Microsoft Visual Basic development environment

introduces the students to the world of Windows-based applications, and Visual C# is one of the top three development environments used in business today. Students build real working Windows programs that include forms, text boxes, drop-down lists, checkboxes and radio buttons. Using these, students build their own web browser and MP3 player, along with other programs. *(Some seniors may be permitted to take this course to fulfill their math requirement for graduation; it may alternately be taken as an upper-level science class. Enrollment preference will be given to upperclassmen and to students requiring the course to satisfy graduation requirements.)*

#### **COMPUTER SCIENCE: DATABASE & APPS DEVELOPMENT – 10<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup> grades**

Nowadays, almost everything relies on databases—from online purchases to Google searches. Students are introduced to Microsoft Access and Microsoft SQL Server, undoubtedly one of the preeminent database platforms in use today. They build their own databases and learn about tables, database views, and what it takes to query a database to get results. Using AppInventor, an online tool and device simulator developed at MIT, students build working Android-based apps and can see their work in action. They also learn the fundamentals of iPhone development using Apple’s XCode platform. Apps developed during this course have included a working xylophone, a working stopwatch, a calculator, a tip calculator, a version of Whack-a-Mole, and a text message interception app. *(Some seniors may be permitted to take this course to fulfill their math requirement for graduation; it may alternately be taken as an upper-level science class. Enrollment preference will be given to upperclassmen and to students requiring the course to satisfy graduation requirements.)*

#### **MATH TUTORIAL – All grades**

The math tutorial is tailored to the individual needs of the student. The coursework focuses on prealgebra, algebra or geometry, depending on the student’s needs, performance in previous math courses, and identified weaknesses. The course incorporates one-on-one or two-on-one instruction and/or review of mathematical concepts and operations that are indispensable for all students. There is an extra fee for this class. More information on the math tutorial program can be found in the “Academic Support Programs” section of this guide.

# SCIENCE

The core mission of The Marvelwood School's Science department is to celebrate and encourage student curiosity and to promote life-long learning and acquisition of knowledge in all aspects of science. Our department's primary goal is to teach scientific and technological literacy, enabling students to compete in the workplace and to make informed, responsible decisions about science-related issues at both the local and global levels. By stimulating the spirit of inquiry, nurturing curiosity, and incorporating real-world science (in addition to other disciplines such as the humanities, math, technology and engineering) into the daily classroom experience, we teach our students to understand that we live in an integrated world, to recognize their responsibility to become global citizens, and to appreciate the unique role that science and scientific collaboration play with respect to creating a world that is sustainable for future generations.

Three credits in science, including two lab sciences, are required for graduation. Most students take four years of science, and some even enroll in two science classes in the junior and/or senior year. All freshmen are enrolled in Biology 1, and with few exceptions, all sophomores take Biology 2. From there, all science courses are considered elective in nature, and students may choose classes in their area of interest or which best support their college-preparatory track. A variety of field trips coupled with hands-on activities wherever possible support the department's dedication to experiential, real world-based learning. Not all courses listed are offered every year.

## **SCIENTIFIC LITERACY, HEALTH & HUMAN BIOLOGY – 9<sup>th</sup> grade\*\***

This team-taught course prepares students to advance in the sciences at Marvelwood. In the fall, students will explore scientific literacy through hands-on activities associated with two project-based topics, one of which focuses on stream ecosystems. Students will learn how to read formal scientific papers and how to transform and communicate their own research into digital presentation posters and a simple ArcGis Story Map. During the winter term, students will focus on health and wellness issues including wellness and goal setting, decision-making, proper nutrition, mental and emotional health, and various manifestations of addiction (alcohol, drugs and gaming). Students will also learn how to better manage stress in their lives. In the spring, students will explore basic cell biology, the structure and function of the major systems of the human body, through physical, cultural, genetic and social lenses. Students will also learn a basic overview of genetics, various diseases and the medical tests used to detect these diseases. Students will receive training in First Aid and Basic Life Support including CPR and use of an Automatic External Defibrillator (AED) and will have the opportunity to earn certification. Term projects, shared with the greater school community, will showcase their knowledge. This class is required of all freshmen.

*(Depending on their academic performance, students may apply for honors credit for the course at the end of the year; applications will be reviewed by the department head and Academic Dean.)*

## **ESSENTIAL PRINCIPLES OF BIOLOGY – 10<sup>th</sup> grade**

This course focuses on the core biological disciplines of evolutionary theory, taxonomy, the three domains and various kingdoms of life, and animal behavior. Topics include scientific method and measurement; the principles of ecology; population dynamics; biological diversity and conservation; classification; natural selection and evolution; genetic engineering, bioethics; epidemiology and disease-causing pathogens; and the study of all manner of non-human life, including protists, fungi, viruses and bacteria, fish, reptiles, amphibians, birds and mammals. Laboratory activities parallel lecture topics and include fieldwork, microscopy and dissection.

## **FORENSIC BIOLOGY & EPIDEMIOLOGY – 10<sup>th</sup> & 11<sup>th</sup> grades\*\***

Forensic Biology is a laboratory-based science course designed for students who are interested in forensic science. It focuses on the application of various scientific disciplines (biology, chemistry, physics, and technology) used in the field of criminology and forensic science. Students will also explore epidemiology, forensic epidemiology, and how epidemiologists study the outbreak and origin of diseases.

## **CONSERVATION BIOLOGY – 10<sup>th</sup> grade**

Ecological literacy begins with learning to identify organisms in our own backyards and communities. This field-based course focuses on organisms and also incorporates core biological disciplines (taxonomy, anatomy, life cycles, evolution, environmental systems, etc.). Students will explore local and global conservation issues and share their discoveries with the local and broader scientific communities using keys, field guides and social media posts on Facebook and iNaturalist, a platform which allows students to share and archive their data with the possibility that it will later be used in formal scientific research at the national or international level. Students must have access to a camera for use in this class.

### **HONORS CONSERVATION BIOLOGY – 10<sup>th</sup> grade\***

Sophomores interested in Honors-level credit in a Biology course may choose to enroll in Honors Conservation Biology. In addition to the regular curriculum detailed above, students interested in pursuing honors credit for the course will be required to create and present an ESRI Story Map which will be entered into a statewide contest. They will also be expected to create a scientific poster presentation and share it in a school meeting or similar forum. These students will also be required to compete on the school's Envirothon team if Marvelwood is able to compete next year.

### **ENVIRONMENTAL SCIENCE – 11<sup>th</sup> & 12<sup>th</sup> grades**

Students who have a strong interest in the environment, enjoy working outside, and can work well independently are strong candidates for this course. Students will participate in a series of hands-on field-based projects throughout the year focused on various environmental themes. They will also prepare an ESRI Story Map for a local land trust preserve. Projects will incorporate Global Positioning and Geographic Information Systems technology as well as the creation of college-level poster presentations. Additional field work outside of class time (at any time of day and/or on weekends) may be required. If the Connecticut Envirothon schedule permits our participation, students will prepare to represent Marvelwood in the statewide competition by taking part in training sessions with professional scientists on several Saturdays each term. Students interested in taking the Advanced Placement exam in Environmental Science may do some independent work with the support of the instructor.

### **CHEMISTRY – 11<sup>th</sup> & 12<sup>th</sup> grades\*\***

This conceptual course surveys topics in Chemistry that tie atomic theory to what is observable on a macro scale. Units include atomic and molecular structure, the periodic table, chemical bonding, intermolecular forces, and chemical reactions. Through a focus on inquiry and hands-on exploration, students connect concepts to real-life topics such as renewable energy, climate change, household chemistry, clean air and water, and the role of chemistry in society and its impact on our environment.

### **AP CHEMISTRY– 11<sup>th</sup> & 12<sup>th</sup> grades\***

This is an advanced course intended to prepare students to qualify for university credit in chemistry. The curriculum includes study from a college-level chemistry textbook and targeted practice for the Advanced Placement test using questions and examples from previous exams. Topics include atomic theory, stoichiometry, thermochemistry, chemical bonding, and kinetics. Enrollment in this course is limited to highly motivated students who have proven their dedication to their studies, and typically requires a recommendation from the previous year's science instructor. It is strongly suggested that students complete a full year of Chemistry before enrolling in this class. Successful completion of upper-level mathematics and/or permission of the instructor may also be required.

### **PHYSICS – 11<sup>th</sup> & 12<sup>th</sup> grades\*\***

This course is aimed at the student who intends to pursue science at the college level and perhaps a career in science, medicine, or engineering. Topics include the laws of mechanics, heat and thermodynamics, waves and vibrations, light and optics, electricity and magnetism, atomic and nuclear physics. Supplementary topics such as the history of physics in nature and energy are introduced where appropriate. As the mathematical demands of physics study are significant, students should have completed Algebra 2 before enrolling in this course.

### **AP PHYSICS I – 10<sup>th</sup>, 11<sup>th</sup> & 12<sup>th</sup> grades\***

AP Physics I is the first half of an algebra-based, introductory college-level physics course. Students cultivate their understanding of physics through inquiry-based investigations as they explore topics such as Newtonian mechanics; work, energy and power; mechanical waves and sound; and introductory simple circuits. Students take the Physics I Advanced Placement exam in May; those who intend to take the SAT II test in Physics in their junior or senior year should plan to take both AP Physics I and AP Physics II, as content from both courses is required for success on the exam. Students enrolling in this course should have completed Geometry and should be concurrently taking Algebra 2 or a more advanced mathematics course.

### **AP PHYSICS II – 11<sup>th</sup> & 12<sup>th</sup> grades\***

AP Physics II is the second half of an algebra-based, introductory college-level physics course. Students expand their understanding of physics through inquiry-based investigations as they explore topics including fluid statics and dynamics; thermodynamics with kinetic theory; PV diagrams and probability; electrostatics; electrical circuits with capacitors; magnetic fields; electromagnetism; physical and geometric optics; and quantum, atomic, and nuclear physics. Students take the Physics 2 Advanced Placement exam in May; those who intend to take the SAT II test in Physics (seniors in the winter, juniors in the spring) should plan to take both AP Physics I and AP Physics II, as content from both courses is required for success on the exam. Students interested in enrolling in this course must have completed AP Physics I with a final grade of C+ or better, and should have taken or be concurrently taking Precalculus or an equivalent math course.

### **ZOOLOGY, ORNITHOLOGY & CITIZEN SCIENCE – 11<sup>th</sup> & 12<sup>th</sup> grades**

This course introduces students to studies in zoology. They will learn about different aspects of domestic and wild animal behavior, both common and bizarre! Students work to socialize guide dog puppies for Guiding Eyes for the Blind and are

introduced to the field of ornithology via a series of Cornell Bird Academy online courses, citizen science projects, and bird banding. Throughout the year, they will engage in woodworking, landscaping, art and sewing projects that will benefit birds and other wildlife. Field trips will include a visit to Yale's Peabody Museum of Natural History, Mystic Aquarium, and local zoos.

#### **ORNITHOLOGY – 11<sup>th</sup> & 12<sup>th</sup> grades**

Using a variety of textbooks and a popular birding magazine, students will learn about birds and critical avian issues, and conduct research about birds. More advanced students will have the option to complete the Home Study Course in Bird Biology and/or other Cornell University courses related to the field of ornithology. Students will participate in a multi-year project evaluating changes in bird populations over time in as the habitat changes in a recent clear-cut area of property owned by a local utility company. Students will be encouraged to use eBird to record their observations both locally and around the state as field trips to popular birding hotspots in Connecticut or neighboring states occur. Student-generated data will be showcased in a variety of projects including scientific poster presentations and story maps.

#### **ADVANCED ORNITHOLOGY – 11<sup>th</sup> & 12<sup>th</sup> grades\***

Students with a serious passion for birds and prior knowledge in the field may choose to enroll in Advanced Ornithology. These students will be enrolled in the online university course "Comprehensive Bird Biology," sponsored by Cornell Lab's Bird Academy, and must complete the course to receive Honors credit. The Advanced class is for motivated students capable of working independently; they must participate in at least one bird observation/banding session at least twice a month, and may be required to pass a placement "quiz" devised by the instructor and/or to obtain permission of the instructor to enroll.

#### **RESEARCH IN CONSERVATION – 11<sup>th</sup> & 12<sup>th</sup> grades\*\***

This course allows students to learn different research techniques when conducting field research projects for community partners ranging from the Connecticut Department of Energy and Environmental Protections to local land trusts. One or two projects will be conducted each term; topics might include bird or bat migration, biological indicators of streams, land trust trail mapping, conservation photography, change in avian populations in a successional area, or amphibian monitoring. Students will collaborate to collect data using an array of scientific technology including DJI Unmanned Aerial Vehicles, Global Positioning Systems, Geographic Information Systems, and bioacoustic technology. Students will be required to communicate their research in the form of scientific posters and ESRI Story Maps. *Due to the nature of the field work and access to different properties to conduct research, class size is limited and permission of the instructor is required.*

#### **SOCIAL PSYCHOLOGY – 11<sup>th</sup> & 12<sup>th</sup> grades**

This course involves an in-depth look at how we as human beings interact with each other in all aspects of our lives. Topics include social perception and how we work to understand the people around us, social cognition and how we process the world around us, how and why we have intimate relationships, the reasons behind stereotypes, and why we are willing to conform to social pressures. A number of papers are assigned, as well as two major research projects involving the students at Marvelwood. Past projects have examined how we define beauty, how individuals perceive themselves in a social world, and how we are affected by fear.

#### **ANATOMY & PHYSIOLOGY – 11<sup>th</sup> & 12<sup>th</sup> grades**

This course employs a multidisciplinary approach to learning the structure and function of the human body. Students apply their knowledge to real situations, e.g. common athletic injuries, surgeries and current medical discoveries. Dissection of a fetal pig via computer will coincide with each body system studied. Research papers and oral presentations are assigned each term. Students who enter Marvelwood School in the eleventh and twelfth grade without a credit in biology are required to take this course to satisfy the biology requirement.

#### **INTEGRATED SCIENCE – 11<sup>th</sup> & 12<sup>th</sup> grades**

This class introduces students to the various software programs and technology of the school's Innovation Lab. In the fall term, students will use the TinkerCad online software system to develop STL files to be used with our Prusa FDM 3D printer. Following a layered learning system and starting with basic design principles such as build-plate dynamics, bridging and angle limitations, the class will learn to design simple parts that can be integrated together to make complex machines. In the winter, students will learn how to use 2D CorelDraw software to explore basic mechanical design and make three-dimensional objects. Using the laser cutter, they will create inlays, box joints, and tabs that can be further employed to create a variety of objects. In the spring, Each students will choose and complete a project using advanced versions of the software and the techniques learned in the previous terms. Prototype creation and the various stages of the design process will be structured to give students a better idea of basic project engineering. *Students must have access to their own laptops with CorelDraw and/or Adobe Illustrator installed.*

#### **COMPUTER SCIENCE: PROGRAMMING – 10<sup>th</sup>, 11<sup>th</sup> & 12<sup>th</sup> grades**

This class introduces students to what it takes to create real-world, working computer programs. It covers three topics in programming: HTML/JavaScript, Visual Basic and Visual C#. HTML/JavaScript is the language of the web. We cover the basics of web page design by examining the Hypertext Markup Language (HTML) used in every single page the students visit



while surfing the web. The basics of the HTML and JavaScript languages are covered, empowering students to build their own web sites and giving their pages real programming functionality. The Microsoft Visual Basic development environment introduces the students to the world of Windows-based applications, and Visual C# is one of the top three development environments used in business today. Students build real working Windows programs that include forms, text boxes, drop-down lists, checkboxes and radio buttons. Using these, students build their own web browser and MP3 player, along with other programs. *(This course may be taken as an upper-level science class; it may alternately fulfill a year's mathematics requirement for some students. Enrollment preference will be given to upperclassmen and to students requiring the course to satisfy graduation requirements.)*

#### **COMPUTER SCIENCE: DATABASE & APPS DEVELOPMENT – 10<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup> grades**

Nowadays, almost everything relies on databases—from online purchases to Google searches. Students are introduced to Microsoft Access and Microsoft SQL Server, undoubtedly one of the preeminent database platforms in use today. They build their own databases and learn about tables, database views, and what it takes to query a database to get results. Using AppInventor, an online tool and device simulator developed at MIT, students build working Android-based apps and can see their work in action. They also learn the fundamentals of iPhone development using Apple's XCode platform. Apps developed during this course have included a working xylophone, a working stopwatch, a calculator, a tip calculator, a version of Whack-a-Mole, and a text message interception app. *(This course may be taken as an upper-level science class; it may alternately fulfill a year's mathematics requirement for some students. Enrollment preference will be given to upperclassmen and to students requiring the course to satisfy graduation requirements.)*

# WORLD LANGUAGES

Marvelwood's World Languages department seeks to promote a supportive environment that empowers students to attain sufficient exposure to a language other than English and allows them to feel comfortable exploring and expressing themselves in a new language. Studying an unfamiliar language fosters and strengthens essential skills such as problem-solving, academic risk-taking, collaboration, critical thinking, and making connections between personal experience and a more global perspective. Our teachers actively look for creative ways in which to make language learning fun and engaging; employing a multi-sensory approach including role play, discussion, interactive video, conversation, and a variety of activities and games, we are able to boost our students' confidence in their ability to be successful in their studies. More importantly, they develop a basic understanding of another culture, an appreciation for cultural and linguistic diversity, and a deeper sense of their roles and responsibilities in an increasingly globalized world.

Two years of world language study is the minimum requirement at Marvelwood School; able students are strongly encouraged to continue beyond the two-year requirement. Two consecutive years of one world language are required, except in very special circumstances as determined by the Academic Dean. Depending on ability and enrollment, class level groupings beyond the second year may vary from one academic year to the next (i.e., Spanish 3 and Spanish 4/5 one year, Spanish 3/4 the next). The world language requirement may be waived for students with a language waiver (obtained as a result of educational testing) or with a documented language-based learning difference.

## **SPANISH 1 – All grades**

For many students, this is the first encounter with a foreign language. This course offers a very basic introduction to the Spanish language through as many of the senses and activities as the teacher's imagination will allow. Topics covered are: present tenses of regular and irregular verbs, stem changing verbs, uses of the infinitive, basic sentence structures, articles, days, months, household and city vocabulary, likes and dislikes, time of day, and other useful vocabulary.

## **SPANISH 2 – All grades**

Students review items covered in Spanish 1 and continue with a study of the idiomatic use of the present tense, the preterite tense, the imperfect tense, reflexive verbs, and short essay assignments. The textbook is supplemented with materials such as films, tapes, music, readers, children's stories, cultural study, and cooking sessions. Memorization of vocabulary continues; there are daily written and oral drills, conversation and comprehension exercises, short reading assignments and compositions. Most students who earn a C or better in Spanish 2 are encouraged to continue their language study with Spanish 3.

## **SPANISH 3 – 10<sup>th</sup>, 11<sup>th</sup> & 12<sup>th</sup> grades\*\***

This course offers a complete study of all advanced verb forms. Students are expected to speak, read and write in Spanish. The text is used as a guide and is supplemented with a number of outside sources, such as literature, movies, and current events. Saturday class is entirely dedicated to various contemporary topics, allowing the students to discuss subjects outside the course work in Spanish.

## **SPANISH 4/5 – 11<sup>th</sup> & 12<sup>th</sup> grades\***

Students are expected to have a basic mastery of the workings of the Spanish language, but will continue their study of advanced grammatical constructions and use. The curriculum aims to develop literary analysis skills in a foreign language and supplements the literature with lessons in history and culture.

## **FRENCH 1 – All grades**

French 1 introduces students to the most basic grammatical structures and vocabulary of the French language. Grammar study focuses primarily on the formation of simple sentences and questions in the present and simple future tenses, using both regular and a few irregular verbs. Other topics include regular, irregular, demonstrative and possessive adjectives; use of stress pronouns; and idiomatic expressions. Vocabulary lists are expanded throughout the term to include time, date and weather; numbers; clothing; colors; geographical names; family members; and over 100 other nouns and adjectives. The culture and geography of France and other French-speaking countries is introduced, and students enjoy several French films during the year. Homework is assigned nightly, and students are tested on their mastery of the material through frequent tests and quizzes as well as a variety of in-class games and exercises.

## **FRENCH 2 – All grades**

In French 2, students continue to expand their understanding of and facility with both written and spoken French. The focus is on more complex grammatical constructions including the formulation of the passé composé, comparison of adjectives, use of the partitive article, forming commands, and use and placement of direct object pronouns in both the present and past tenses. A

great deal of emphasis is placed on mastery of both irregular verb conjugations and idiomatic expressions. Students are encouraged to communicate in French and to speak and read aloud with proper pronunciation and inflection. Two interactive video series, as well as a variety of French films, allow students to practice listening to, making sense of, and responding to French spoken by native speakers. Vocabulary lists covered in this course include shops and shopkeepers, foods, rooms of the house, and parts of the body. Homework is assigned nightly, and students are tested on their mastery of the material through frequent tests, quizzes and short translation assignments as well as a variety of in-class games and exercises.

**FRENCH 3 – 10<sup>th</sup>, 11<sup>th</sup> & 12<sup>th</sup> grades\*\***

French 3 offers motivated students the opportunity to increase their knowledge of the subtleties of advanced French grammar and constructions. Students work toward mastery of such grammatical units as reflexive verbs; the future, present subjunctive, imperfect and conditional tenses; use of the pronouns “y” and “en”; and formation of the present participle. Reading and writing in French becomes the focus of much of the students’ effort. They read a variety of French literature, from children’s books to short novels to magazine and newspaper articles. Students transcribe from dictation and are challenged to summarize and answer questions about clips from French films, TV shows, and interactive and educational videos. They may visit French web sites or correspond with pen pals in a number of French-speaking countries. The teacher strives to conduct every class exclusively in French, and to increase students’ confidence with expressing themselves in the language. Homework is assigned nightly, and students are tested on their mastery of the material through frequent tests, quizzes and translation assignments as well as a variety of in-class readings, dictations and other exercises.

**FRENCH 4/5 – 11<sup>th</sup> & 12<sup>th</sup> grades\***

French 4/5 is designed for students who already have an advanced knowledge of the language and can use it to study the history, literature, and art of France. The curriculum emphasizes reading, writing and speaking in French. Students read about, research, and discuss several eras in French history. Analysis and discussion of the art and literature of the period further enhances the historical study. Review of advanced French grammar, including a comprehensive review of all the basic tenses, the compound tenses, the subjunctive, and other more advanced rules and constructions, continues throughout the year.

## OTHER ELECTIVE COURSES

Elective courses are offered by the term, but several may be taken for one, two or three terms. Not all courses listed are offered every term or every year.

### **INTRODUCTION TO THE AMERICAN LEGAL SYSTEM – All grades**

This term-long elective course is designed to provide students with an introduction to various areas of the law, including contract law, criminal law, and tort law. Students will learn about civil procedure and how to litigate a case, and will read actual legal cases that deal with the concepts they are studying. Once mastery of legal principles is attained, students will apply what they have learned to real-life situations.

Required reading from textbooks, treatises and study guides will be assigned; oral and written assessments are also a part of this course.

### **HARRY POTTER & PHILOSOPHY – All grades**

This class explores various philosophical issues through the seven *Harry Potter* novels and eight films. The ideas and works of philosophers such as Socrates, Plato, Aristotle, Confucius, Lao Tzu, Wollstonecraft, and Dewey will be analyzed in the context of the Harry Potter storyline. Students will write a five-paragraph essay each week about their thoughts on the ideas discussed. Students need not be familiar with the novels or the films before they enter the class.

### **THE WALKING DEAD & PHILOSOPHY – All grades**

In this term-long elective class, students address philosophical issues and important life questions by talking about the alternative reality that zombies represent. Using readings from *The Ultimate Walking Dead and Philosophy* and graphic novels, as well as analysis of selected TV and film clips, we will seek to answer questions such as "What is the difference between leadership and power?", "What happens to our moral compass when we are faced with making impossible choices?" and "What is it that makes us truly human?" Students will also examine the role of dystopian fiction in a global society. Several short reflection papers will be assigned.

### **POPULAR CULTURE & PHILOSOPHY – All grades**

This class explores various philosophical issues through novels, comics, television shows, and movies such as *Troy*, *The Matrix*, *Inception*, *X-Men: Days of Future Past*, *The Walking Dead*, *The Dark Knight Rises*, *Groundhog Day* and *The Office*. The ideas and works of philosophers such as Hobbes, Descartes, Mill, Bentham, Marx, Nietzsche, and Arendt will be analyzed in the context of the various storylines. Students will write a five-paragraph essay each week about their thoughts on the ideas discussed. Students need not be familiar with the various storylines before they enter the class.

### **MIDDLE EARTH & PHILOSOPHY – All grades**

This class explores various philosophical issues through *The Hobbit* and *The Lord of the Rings* novels and six films. The ideas and works of philosophers such as Machiavelli, Locke, Hegel, Rousseau, Kant, and Rand will be analyzed in the context of the storyline. Students will write a five-paragraph essay each week about their thoughts on the ideas discussed. Students need not be familiar with the novels or the films before they enter the class.

### **LEGO ROBOTICS – All grades**

This class will introduce students to mechanical design, computer programming and robotics, using the LEGO EV2 programmable brick system. Objectives of this course include the design, building and programming of complex robots. Students will have the opportunity to learn to program their robots using the JAVA programming language. This class supports the Science, Technology, Engineering and Mathematics (STEM) fields in education.

### **HAMILTON: ANATOMY OF A PHENOMENON – All grades**

In this term-long elective course, students will explore *Hamilton*, the smash Broadway musical that has captured the imagination and spirit of America. We will compare historical facts about Alexander Hamilton and the American Revolution with the artistic choices made by director Lin Manuel Miranda. Our examination of the show and its international impact will focus on three themes: looking at a monumental period of history through one person's eyes, studying the artistry of the play itself, and exploring how non-historians understand and interpret the past.

### **POLITICS IN FILM: THE COLD WAR – All grades**

The objective of this elective class is to provide students with an engaging look into the early years of the Cold War. Students will gain an understanding of the global political and social landscape of the 1950's and early 1960's and discuss how it relates to global

issues today. Using a variety of films (*Dr. Strangelove, The Bedford Incident, Fail Safe, The Spy Who Came In From The Cold, 7 Days in May*), we will examine the fears and anxieties that influenced both our culture and our politics during the height of the Cold War. Topics and events discussed in class will include the Red Scare, McCarthyism, the Berlin Wall, the Cuban Missile Crisis, and the ethics of mutually-assured destruction (M.A.D.). Participation in discussion and debate is an important part of the course. An interest in world politics is the sole prerequisite for this class.

### **CREATIVE WRITING – All grades**

The goal of the creative writing course is to teach students how to open themselves to the creative process and to their own creative inner voices. Recognizing that each student has a unique learning style, the focus is on different techniques of stimulating creativity. Each student's finished work may be published in the school newspaper.

### **SCREENWRITING – All grades**

The course offers an introduction to all phases of writing for movies. Students gain an overview of the history of film and screen a diverse list of American and foreign movies from every decade of the art form's existence.

### **DRONES AND BIOACOUSTICS – All grades**

In this elective course, students will learn about drones and how they are used in the fields of conservation, heritage preservation and emergency management. They will be introduced to drone technology and safety via Drone Pilot Ground School, an online test prep course for commercial drone pilots looking to pass the FAA Aeronautical Knowledge Test for a Remote Pilot Certificate. This program strengthens the knowledge base of recreational users and also helps students wishing to use drones for non-recreational purposes understand the requirements needed to operate unmanned aerial vehicles at the commercial level. Students will capture drone photography and will also learn about the use of Bioacoustics -- extracting the calls and songs of amphibians, birds and sometimes mammals captured in Kent using passive acoustic recorders and Raven Lite software. They will also learn how to generate spectrograms of their sounds and create visual recordings of their sounds using Camtasia software. Students wishing to use a drone for a project and/or to assist in conservation or emergency management projects should explore these options with their teacher and the school's Safety Coordinator.

*Students with their own drone may bring it to campus provided the drone model is cleared with the Science Department chairperson and/or Safety Coordinator ahead of time and that it is kept in the science labs when not in use. Drones must also be registered for recreational use via FAA's UAS Flown by Recreational Fliers and Modeler Community-Based Organizations (Formerly Section 336) at [https://www.faa.gov/uas/getting\\_started/register\\_drone/](https://www.faa.gov/uas/getting_started/register_drone/). The Science Department chairperson or Safety Coordinator can assist with this process.*

### **WEATHER PREDICTION & PRESENTATION – All grades**

This elective class introduces students to the basics of meteorology including cloud formation, humidity, temperature, and surface maps. We will use the School's new Earth Networks weather station to collect real-time data and create and maintain a weather prediction blog. There will be an emphasis on research and introductory scientific writing skills in support of a term-long project and presentation.

### **MINDFULNESS AND THE TEENAGE BRAIN – All grades**

In this elective course, students learn practices to help them be more self-aware, manage their thoughts and emotions, and use those skills to strengthen their relationships with others. Students will learn mindfulness and breathing techniques to help them learn to be present and to observe themselves and those around them with equanimity. They will understand how and why these practices can help regulate their emotions as they navigate daily life. The course will focus mainly on daily practice, supplemented by readings from books such as *Brainstorm* by Daniel J. Siegel, MD.

### **PERSONAL FINANCE 101 – All grades**

This class prepares students to assume personal responsibility for their finances and to meet the financial demands and expectations typically required of young adults in college or in the working world. We will examine a variety of important topics including different types of bank accounts, keeping a checkbook/check register, check writing, bill paying, budgeting for daily expenses/big-ticket items/vacations, the good and bad of credit cards, understanding different types of insurance, paying taxes, and early planning for retirement. Starting good habits now offers the best opportunity for personal financial success in the future.

### **COMPUTER BASICS – All grades**

Have you ever wondered what makes a computer tick or how the Internet works? Do you need to get better acquainted with Microsoft Word, Excel, email or PowerPoint? Have you ever wondered why Tweets are limited to 140 characters, or how our fascination with computers all began? If so, then this is the class for you! Less technical than Marvelwood's programming classes, Computer Basics provides a comprehensive overview of essential functionality and allows students to experiment with web page editors, image processing software, speech recognition software, and any other types of software they may want to explore.

# THE CAPSTONE EXPERIENCE

11<sup>th</sup> grade

The junior year Capstone Experience is an opportunity for interested, motivated juniors to personalize their learning and explore an area of personal passion. Students involved in the program identify a real-world problem or opportunity and develop a unique solution to address the problem or fill a void. Solutions can take the form of prototypes, lesson plans, awareness campaigns, documentary films, art or music performances, or another creative final product. Students will work on these projects under the guidance of a teacher but will do much of the work independently. They will make decisions and drive their own learning as well as conquer roadblocks and problems that arise. During the prototyping and development phases of their projects, students will seek out expert mentors who can provide expertise on projects. These mentors may be members of the faculty or of the extended Marvelwood and/or local community. All students will create a website and blog to document their process, market their final product, and demonstrate their research. As a culminating experience, students will showcase their projects for the Marvelwood community and, depending on the end-of-year schedule, may be able to participate in the statewide Exposition in late May.

## ACADEMIC SUPPORT PROGRAMS

### THE LEARNING SUPPORT PROGRAM

The mission of The Marvelwood School's Learning Support department is to provide the support and tools that students with learning differences need in order to experience academic success, increase self-confidence, and acquire strong learning and self-advocacy skills needed in college and beyond. In daily classes called "Strategies," students at every level of ability are encouraged to participate actively in their studies, practice self-advocacy, and accept guidance from the professionals with whom they interact every day.

Teachers at all levels of instruction coordinate with our Learning Support staff to understand and meet the needs of their students, and to provide the appropriate accommodations and modifications that support their academic needs and learning profiles. Learning Support faculty collaborate closely with all other departments at Marvelwood to ensure that the skills students adopt in their Strategies classes support the mainstream class curricula in a timely, informed and seamless manner. We aim to identify and remediate weaknesses in basic skills, to support a student's efforts in content classes through the use of specific learning strategies or assistive technology, and to fill in the gaps which may present an impediment to success in college preparatory coursework. Ultimately, the goal of the Learning Support Department is to use a scaffolded program model to gradually move students toward full independence, where they use all the skills and resources at their disposal without teacher prompting to achieve and maintain academic success.

Strategies classes meet daily as part of the regular academic schedule, so students are not pulled out of other courses to receive support, nor do they have to meet before or after school.

Learning Support programming offers two distinct levels of support. Placement is determined by the recommendations presented by current psycho-educational or neuropsychological evaluations, prior academic history including teacher observations and recommendations, and parent input.

Learning Support classes are available to any student for an additional fee.

### STRATEGIES I

The Strategies I program is designed for students who require intensive intervention to support their learning needs. Students in this program meet daily with a teacher in a one-on-one environment. Teachers support students' individualized language instruction in order to best support their academics, and may also serve as readers or scribes for students with these accommodations.

Students in Strategies I typically require learning support intervention throughout their high school experience.

## **STRATEGIES II**

The Strategies II program is designed for students who require less intensive academic support and who will benefit most from strengthening and practicing study and organizational skills. At this level, students meet with a faculty member in groups of no more than four to hone skills essential for independent educational success, including material management strategies; how to organize, prioritize and execute assignments; making inferences from text; paraphrasing and note-taking; how to study for tests; and how to manage their time. Students also receive guidance and support on specific assignments as needed. Students are generally grouped by grade level so that shared assignments can be addressed and specific skill sets can be introduced and developed.

Students in Strategies II are typically able to move on to complete independence from learning support after a year or two in the program.

## **MATH TUTORIAL**

Though Marvelwood's extensive mathematics curriculum can typically accommodate students with weak basic skills or who struggle with math learning, those students with dyscalculia or other significant mathematics-related learning differences may enroll in Math Tutorial, a one-on-one or small-group math class that replaces the traditional math sequence. Some students enroll for a year to fill in gaps in prior knowledge with the aim of re-entering mainstream math courses; others may need the guidance and structure of Math Tutorial for longer periods. Four years of high school math study is required for graduation.

## **THE SEBRING-VAUGHN LEARNING AND LANGUAGE LAB**

Marvelwood's Learning and Language Lab features four private tutorial classrooms accommodating both one-on-one and small-group learning. The hub of the Learning Lab is a computer lab featuring Apple computers equipped with Google Apps for Education, audio books, and assistive technology software, including voice recognition software and text-to-speech programs.