

**SVAHS**

**Academic Course Selection Guide**

*School Year 2017-2018*

# ENGLISH

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Courses in all grades are aligned with the Massachusetts Curriculum Frameworks for English Language Arts and Literacy. Students develop reading, writing, speaking, listening, and language skills that help prepare them for career and further education. The consistent use of informational texts and vocabulary strategies helps build reading and thinking skills in all vocational and subject areas.

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**GRADE 9 ENGLISH**

**English 9**

Grade nine courses improve literacy skills through reading and analysis of mythology, drama, fiction, and non-fiction. This involves explicit writing and reading activities that hone skills for the 10th grade state test and also develop critical thinking and communication skills that inform their upcoming vocational and career goals. Introductory research skills are also covered.

 **Advanced English 9**

This course is for college-bound students and requires more rigorous reading and writing projects. It aligns with the English 9 curriculum, is supplemented with additional informational and literary texts, and includes more outside of school reading. Students are expected to perform writing tasks at a higher level of critical thinking, depth, and detail.

**Freshman Writing**

Writing courses are intended to engage students in critical thinking while developing writing skills that will translate to higher MCAS scores. This year-long course begins with a children’s literature unit focusing on the literary elements of fiction, audience, and critical reviews, then students write and present a children’s book. In the second unit, students read and analyze worker interviews. They choose and interview a professional who works in their shop trade then they apply writing skills used for interviewing, letter writing, and personal narrative. In the last unit, students read memoirs, focusing on figurative language, literary elements and theme, and then write one of their own.

**GRADE 10 ENGLISH**

**English** **10**

Students focus on reading fiction, poetry, and informational texts along with writing assignments that prepare students for the state test. Students also do a research and writing project that helps them to build critical information gathering skills while increasing self-awareness. Analysis of literature includes understanding and writing about theme, character, main idea, topic, and figurative language.

**Advanced English 10**

This course is for college-bound students and requires more rigorous reading and writing projects. It aligns with the English 10 curriculum, is supplemented with additional informational and literary texts, and includes more outside of school reading. Students are expected to perform writing tasks at a higher level of critical thinking, depth, and detail.

**Sophomore Writing**Writing courses are intended to engage students in critical thinking while developing writing skills that will translate to higher MCAS scores and improved literacy in all subjects. This year-long course begins with a media literacy unit in which students study propaganda techniques then develop products and advertisements using the techniques. For the next unit, titled “Writing for Social Action,” students read a variety of informational texts and opinion pieces on an important local or global problem, write a problem-solution paper on a topic they choose, then write a letter to the editor. The final unit focuses on studying, identifying, and appreciating many forms of poetry and concludes with poetry writing and a poetry reading café.

**GRADE 11 ENGLISH**

**English 11**

The eleventh grade curriculum is structured around increased understanding of the role that reading and literacy skills play in the classroom, in their future, and in the word as a whole. Students read and analyze fiction and drama. A focus on informational texts culminates in a research project that allows students to explore the theme of sustainability as it relates to their careers and their roles as citizens. Early in the year, 11th graders write resumes and cover letters in preparation for application to co-op jobs later in the year.

**Pre-AP /** **Advanced English 11**
This is a course designed to meet the needs of students who are planning to attend college. It will follow a Pre-AP Language and Composition curriculum, with a focus on how writing achieves its effects. Students will be expected to read and write extensively outside of class, while class time will be devoted to revising writing, discussion, and projects. This course will prepare students to use classical and contemporary literature as models for exemplary creative and analytical writing. PSAT/SAT verbal and composition preparation are included.

**GRADE 12 ENGLISH**

**English 12**

Twelfth graders begin the year with a research project that helps them to develop their organization skills along with reading, writing, and critical thinking to evaluate sources. They explore topics that are career or college related in order to inform their post-graduation goals and choices. Students also read and analyze drama, fiction, and non-fiction, while writing more extensive critical essays. The year ends with a multi-genre reflection project that requires synthesis of and reflection on themes addressed throughout the year.

**Advanced English 12**

Designed for college-bound students, this course aligns with the English12 course but requires more independent work. Students are expected to read extensively outside of class, while class time is devoted to writing, discussions, and projects. SAT verbal and composition preparation are also covered. This course will provide students with the opportunity to take the AP exam, if desired.

**MATHEMATICS**

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All students will be placed into math courses through the Guidance Department. Placement will be based on the student’s performance, teacher recommendations, and placement testing.

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**GRADE 9 MATH**

 **Advanced Algebra I**

This is a course to prepare students for higher level of mathematical reasoning. Students are expected to have a general concept of Algebra. This class is recommended for highly motivated students who have excellent math skills. This course will cover the traditional topics taught in a one year Algebra I course, as well as some topics generally taught in Algebra II, such as systems of equations, summation and deeper exploring of the Real Number System. The pace of this class will go quicker than Algebra I.

**Algebra I**

This is a traditional Algebra I course designed to give students skills that will provide a foundation for further Math courses. This will include all Algebra topics from integers through quadratic equations. It will focus on linear equations, proportions, inequalities, polynomials and quadratics. This course is recommended for motivated students who have solid math skills.

**Integrated Math I**

This course will review numeracy and basic math skills (such as adding, subtracting, multiplying and dividing integers) as well as provide an introduction to algebra topics. Topics include the order of operations; the study of patterns and relationships; functions; solving equations and inequalities; and manipulation of and graphing linear equations. Class sizes are generally small.

 **Grade 9 Math-Shop Week**

**GRADE 10 MATH**

**Advanced Geometry**

This standards-based year-long course includes all topics covered in a normal Geometry course but stresses the formal structure of geometry and the application of algebra and deductive reasoning to geometric problem solving. It also emphasizes critical thinking involving geometric relationships, and their proofs.

**Geometry**

This course will enable students to identify and work with angles, polygons, and circles. Students will learn altitudes and medians connected with these figures. Perimeter, area, and volume of geometric figures will be stressed. Students will study parallel lines, transversals, ratio and proportion, and similar figures. The Pythagorean Theorem, theorems associated with plane geometric figures, right triangle properties, and working with radicals will be studied. This course is recommended for highly motivated students who have successfully completed Algebra I.

**Integrated Math II**

This course will cover topics included in Algebra and Geometry. It will focus on linear equations, polynomials, evaluating charts & graphs, graphing , area and perimeter of different geometric shapes. The class goes at a slower pace according to the students’ needs.

**Grade 10 Math-Shop Week**

**GRADE 11 MATH**

**Advanced Algebra II**

This course will build on topics from Algebra I, and will be rigorous. New topics stemming from Algebra I skills will include systems of equations, quadratic equations, polynomials and factoring, conic sections, and logarithms.

**Algebra II**

This course will review all topics from Algebra I. New topics will include binomial theorem, quadratic equation, irrational and complex numbers, negative and fractional exponents. Students will use graphing calculators to graph equations and solve simultaneous equations using matrices.

**Integrated Math III**

This course will cover topics included in Algebra I and Algebra II. This class will encompass solving multistep equations, solving and graphing inequalities, solving absolute values and solving absolute inequalities. Students will also be briefly introduced to word problems involving multistep and inequality equations. This class will also cover linear equations, graphing those equations and determining the x and y intercepts; students will also be briefly introduced to the equation of the line through word problems. This course will also include solving systems of equations and the factoring, multiplying/dividing, adding/subtracting of polynomials. Finally it should be noted that this class will be relatively small, with the instructor being attentive to student’s individual learning needs.

**GRADE 12 MATH**

**Pre-calculus**

This course will study the topics presented in Trigonometry (below) with more in-depth coverage combined with pre-calculus topics.

**Trigonometry**

Pre-requisite Skills: Apply and Solve the Pythagorean Theorem; Simplify Radicals; Rationalize the Denominator; Add, Subtract, Multiply and Divide Fractions; Solve One-Step, Two-Step and Multi-Step Equations; Add, Subtract, Multiply and Divide Polynomials; Factor Binomials and Trinomials; Use the Angle Sum Theorem; and Solve Special Right Triangles.

Course Description: This course applies topics from Algebra and Geometry in various applications of Trigonometry. Topics include trigonometric ratios and functions; inverse trigonometric functions; applications of trigonometry including the law of sine and the law of cosine; solving a trigonometric equation; graphing trigonometric functions, including phase shifts; proving trigonometric identities. When time allows, topics will additionally include imaginary and complex numbers as well as converting between logarithmic and exponential form.

**Integrated Math IV**

This course will cover various topics included in, but not limited to, Algebra I and Algebra II. This course encompasses a review of solving multistep equations, while also introducing students to solving multistep word equations. Students will learn to simplify and factor polynomials while also understanding the ‘laws of exponents’. Additionally, Students in Integrated IV will review linear equations but also graph and write ‘the equation of the line’, through word problems. Furthermore, students will learn how to solve two system equations, both numbers only and word problems. As this is a senior class, students will also cover, in the latter months, topics related to money and percentages; specifically bank loans and credit cards. Finally it should be noted that this class will be relatively small, with the instructor being attentive to student’s individual learning needs.

**SCIENCE**

**GRADE 9 SCIENCE**

**Biology I**

Topics will focus on the Massachusetts Curriculum Frameworks and will include scientific method, organic molecules, cell structure and function, cell division, genetics, evolution and ecology. Students will learn through a variety of activities including hands on projects, laboratory experimentation, research, reading, writing, portfolios, presentations and inquiry

**Introduction to Engineering Design – Project Lead The Way**

Introduction to Engineering Design is an introductory course, which develops student problem solving skills through the use of the design process. Students will complete various hands-on projects, technical sketching, three-dimensional design of solids through computer modeling, and apply engineering

standards.

**Physics I**

This introductory course combines mathematical reasoning, observation skills, and critical thinking skills to investigate natural laws. Topics include: measurement, estimation, unit conversion, forces, motion, velocity, momentum, energy, work, and power.

**GRADE 10 SCIENCE**

**Biology II**

Topics will focus on the Massachusetts Curriculum Frameworks and will include scientific method, organic molecules, cell structure and function, cell division, genetics, evolution and ecology. Students will learn through a variety of activities including hands on projects, laboratory experimentation, research, reading, writing, portfolios, presentations and inquiry.  This is the second half of the biology curriculum needed for MCAS preparedness.

**Biomedical Sciences (PBS) – Project Lead the Way**

The first course of the Project Lead the Way, Biomedical Science Programs, this course focuses on an introduction to biomedical sciences and careers through a project based, student centered approach. The course teaches basics of biology by applying them to the systems of the human body. Students use a variety of electronic and traditional probes to monitor and then interpret basic body functions such as blood pressure, heart rate, and electrical activity of the heart using EKG. This course includes laboratory experiments and is project based.

**Engineering the Future**

In this second year course the students Design a "Putt - Putt Boat". The project is designed to teach about hydraulics, and pneumatics (how gasses are affected by temperature, pressure, volume, area, and force), thermodynamics, friction, and Newton's Laws of Motion. The second half of the year is a study of Electrical Circuits and how electricity works.

**Principles of Engineering- Project Lead the Way**

Principles of Engineering, the third Project Lead the Way course provides an overview of engineering and engineering technology. Students develop problem solving skills by tackling real-world engineering problems. They explore four engineering systems and manufacturing processes: mechanical, fluid, electrical, and thermal. Students learn the properties of various materials, how materials are shaped and joined, and material testing. Through theory and practical hands-on experiences, students will address the emerging social and political consequences of technological change.

**GRADE 11 SCIENCE**

**Anatomy I**

The first section of a two-year course on the anatomy and physiology of the human body, topics covered include an introduction to all body systems, biotechnology as it relates to DNA transformation and gel electrophoresis, as well as an in depth look at tissue, the integumentary, circulatory, skeletal, urinary, digestive systems, and the eye as an organ. This course includes laboratory experiments as well as dissections of different organs and organisms.

**Renewable Energy**

This is a Grade 11 elective course that supports students from any of the shop areas. Their goal is to introduce and reinforce the students’ use of energy in their housing, transportation, product selection and vocational economic viability by focusing the energy use streams, both renewable and non-renewable, in the complex biological, chemical and physical systems in use today.

It strengthens fundamental understanding of energy, its origins and storage, energy transfer, efficiencies of common processes, and worldwide patterns of energy use and its effects on climate change. Students delve into understanding monthly energy bills, building energy audits (using the school grounds as a living laboratory) and laws and regulations that govern the energy industry. Students are introduced to four types of renewable energy now commercially used: solar thermal, photovoltaic, wind and bio-fuels, and learn hands on how to site, install and maintain these systems, and understanding the history of the renewable energy industry.

**Human Body Systems I- Project Lead the Way**

This course focuses more specifically on the anatomy and physiology of the different human body systems. This first year of the course will focus on systems of the body that relate to Identity, Communication, and Power within the human body. Students use a variety of probes to monitor, collect, and interpret data from the different body systems. This course includes laboratory experiments and is project based.

**Advanced Digital Electronics-PLTW (only offered in school year 2015-2016 for students who took DE in 10th grade)**

**Computer Integrated Manufacturing-PLTW-Shop Week**

Project Lead The Way CIM Computer Integrated Manufacturing (CIM) - This course teaches the fundamentals of computerized manufacturing technology. It builds on the solid-modeling skills developed in the Introduction to Engineering Design course. Students use 3-D computer software to solve design problems. They assess their solutions through mass property analysis (the relationship of design, function and materials), modify their designs, and use prototyping equipment to produce 3-D models.  Students will use their 3D designs and engineering CAM software to create complete CNC programs and set ups. These programs will be used in the CNC equipment to manufacture finished products.  Students program robots to handle materials in assembly-line operations.

**GRADE 12 SCIENCE**

**Anatomy II**

This is the second year continuation of Anatomy I .Topics to be covered include muscular system, nervous system, and endocrine system. Current biotechnology topics and applications will be dispersed throughout this course as they relate to specific areas. Areas of human health will be discussed as it relates to nutrition, diseases, and disorders. This course includes laboratory experiments as well as dissections of different organs and organisms.

**Chemistry**

Chemistry is a full year course designed to give seniors a solid introduction to Chemistry. This college preparatory class is aligned with the Massachusetts Curriculum Frameworks and requires moderate mathematical ability to assure success. Laboratory investigation is a critical component to the course where students will develop problem solving and critical thinking skills. Topics covered may include: measurements and properties of matter, atomic structure, and nuclear chemistry, periodicity, chemical bonding and nomenclature, chemical reactions and stoichiometry, states of matter, kinetic theory and thermo chemistry, solutions, rates of reaction, equilibrium, acid-base and oxidation-reduction reactions. It is strongly recommended that students have access to their own, basic calculator for this course.

**Human Body Systems II- Project Lead the Way**

A continuation of topics covered in HBS. This course will cover systems as they relate to Movements, Protection, and Homeostasis within the body. Students use a variety of probes to monitor, collect and interpret data from the different body systems. This course includes laboratory experiments and is project based.

**Engineering Design and Development- Project Lead the Way**

This is the capstone course in the Project Lead the Way sequence. Students apply what they have learned in academic and pre-engineering courses as they complete challenging, self-directed projects. Students work in teams to design and build solutions to authentic engineering problems. Examples of projects may include a robotic mascot for the school, a remote-controlled hovercraft, or a solar-powered device. Each team must submit progress reports and a final research paper. The team members then defend the solution with an oral presentation before an outside review panel.

**Circuit Design**

This course goes beyond looking at electrical systems in general and introduces students to applied digital logic, a key element of careers in engineering and engineering technology. Students will create a truth table, logic expression, and design circuits that satisfy a desired outcome when presented with various scenarios. Students test their circuits using industry-standard software and then build their circuit on a breadboard. Students use mathematics, logic, and science in solving real-world problems.

**HISTORY**

**GRADE 9 HISTORY**

**United States History I**

As aligned with the Massachusetts History and Social Studies Framework and Common Core Standards, this course will chronologically examine American History from 1763 to the Reconstruction Era (1877). As part of this course students will investigate the cause and consequences of the American Revolution, the origins of the Constitution and American democracy, and the challenges the new nation faced postwar. Other units of study include the Industrial Revolution, westward expansion, and Manifest Destiny. The course will conclude by examining the political, social, and economic changes the U.S. experienced leading up to the Civil War and life during Reconstruction.

**Advanced United States History I**

The topics and events that are covered in the advanced class are the same as those that are covered in the non-advanced class.  However the review of the topics and events will be more in depth, will require analytical thinking, and examining primary and secondary sources.  Students can expect to work at a more rigorous pace, will need to do outside reading, and will have to complete a term paper at the end of each trimester.

**GRADE 10 HISTORY**

**United States History II**

As aligned with the Massachusetts History and Social Studies Framework and Common Core Standards, this course will chronologically examine American History following reconstruction to modern times. The course will review the impact of the Civil War and Reconstruction on the U.S. Other units of study include westward expansion, industrialization, immigration, World War I and II, and the Great Depression. The course will conclude by examining economic growth and consumerism postwar, U.S. foreign affairs, and the Civil Rights Movement.

**Advanced United States History II**

The topics and events that are covered in the advanced class are the same as those that are covered in the non-advanced class.  However the review of the topics and events will be more in depth, will require analytical thinking, and examining primary and secondary sources.  Students can expect to work at a more rigorous pace, will need to do outside reading, and will have to complete a term paper at the end of each trimester.

**GRADE 11 HISTORY**

**World Cultures**

This is a survey course in World Cultures and Geography presented using an area studies approach allowing the student to develop an appreciation for the interconnection among the five fields of social studies. Students will also appreciate how culture regions are grouped, how they change, how they evolve, and how there is a connection between geography and current events.

**US History II**

Course Description needed

**GRADE 12 HISTORY**

**Psychology**

This course is the study of scientific psychology and the many diverse fields within psychology. It is based on scientific methodology which gets to the root of how we know what we know both about ourselves and others. Units include: the biological basis for behavior, sensation and perception, learning, development, theories of personality, psychological disorders, and therapies.

**Modern America and Global Affairs**

Did the United States win or lose the Vietnam War? When did America become a global superpower? How did the events of September 11, 2001 change the world forever? This course examines Modern American History from the post World War II period to the present through the study of military history, current events, economics, politics, and global affairs.