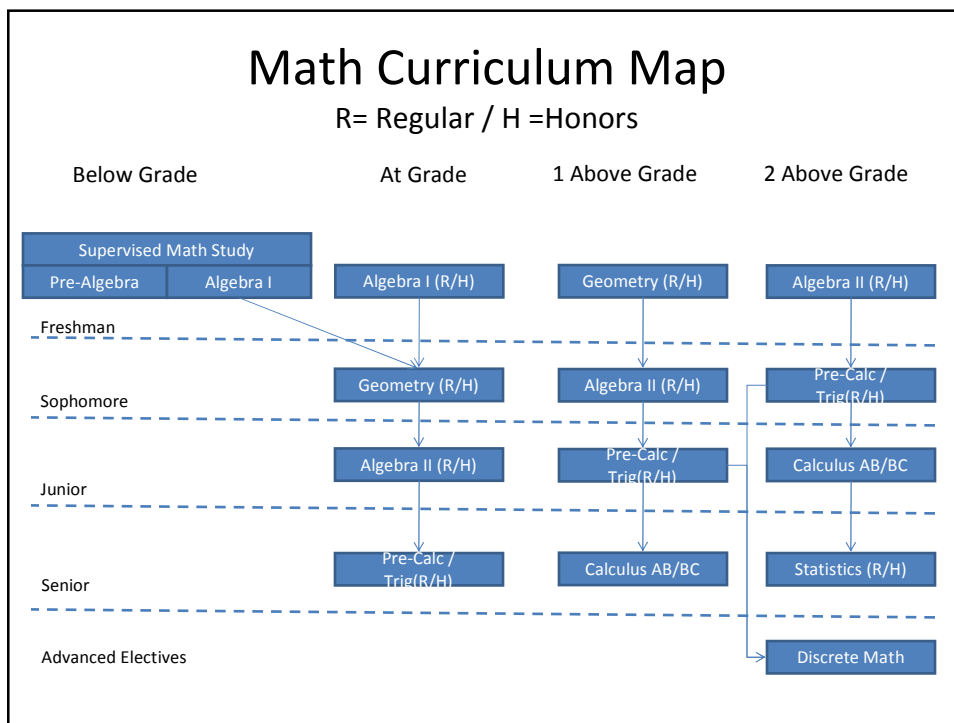


APPENDIX E

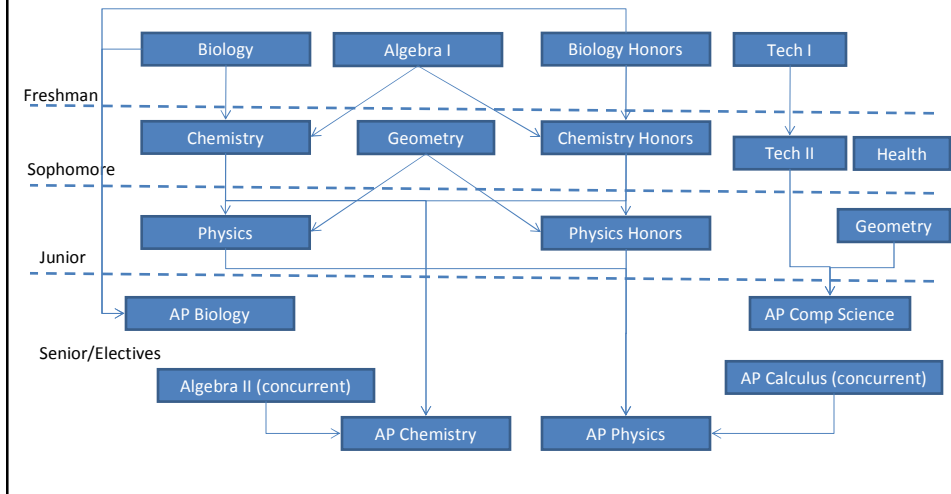
# Longmont Charter High School

## Preliminary and Proposed Curriculum Maps and Course Descriptions

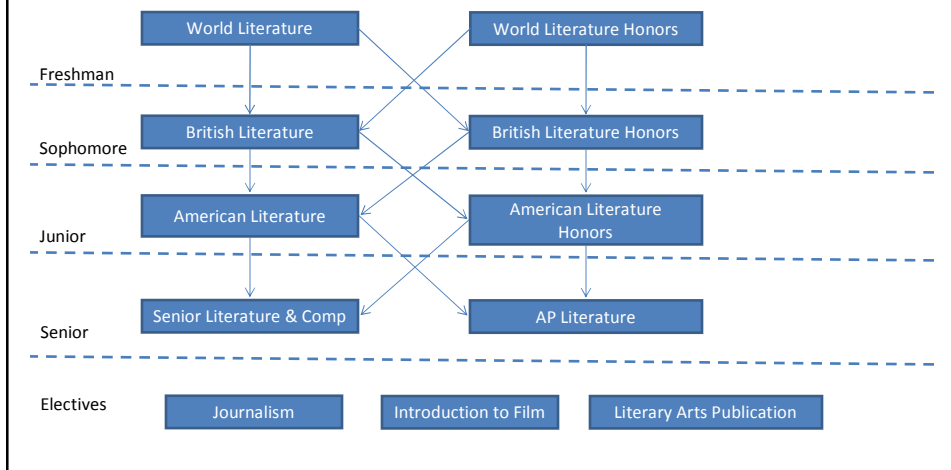
Open 2011

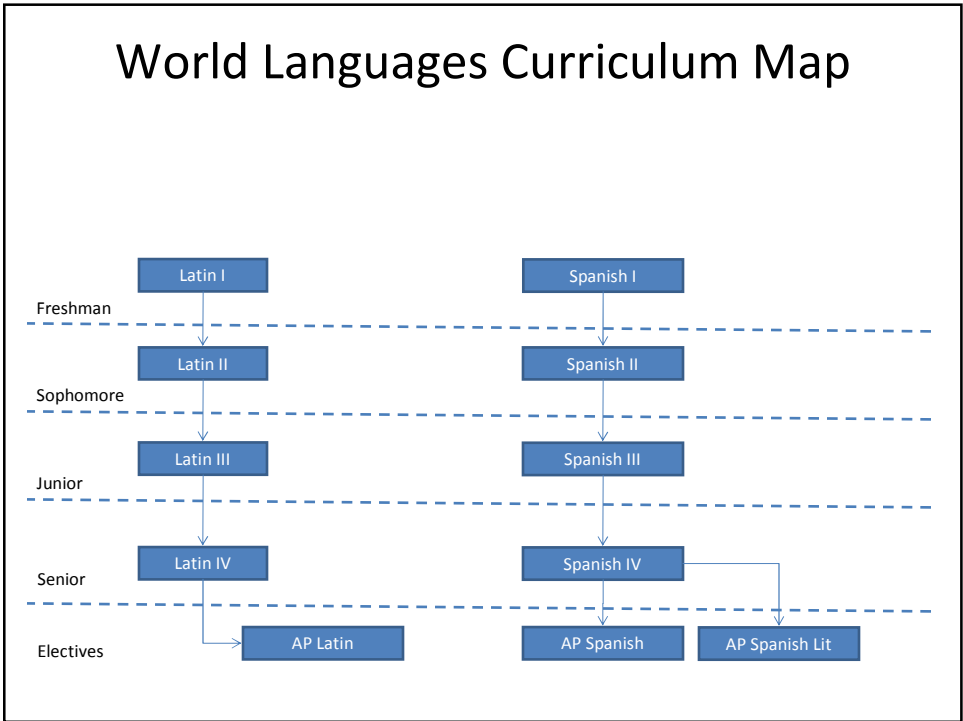
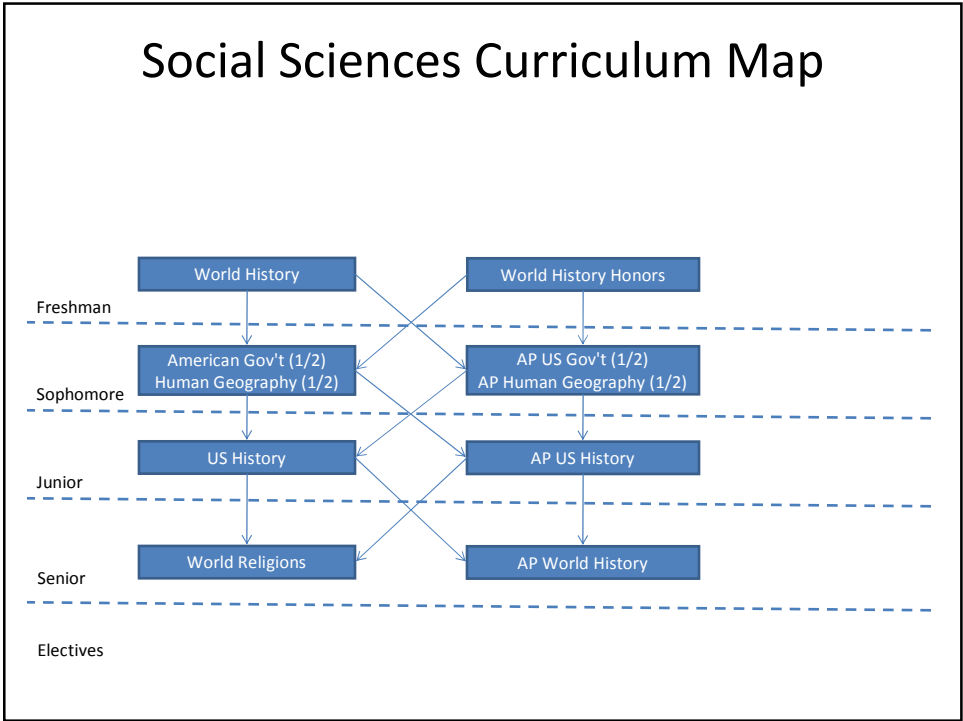


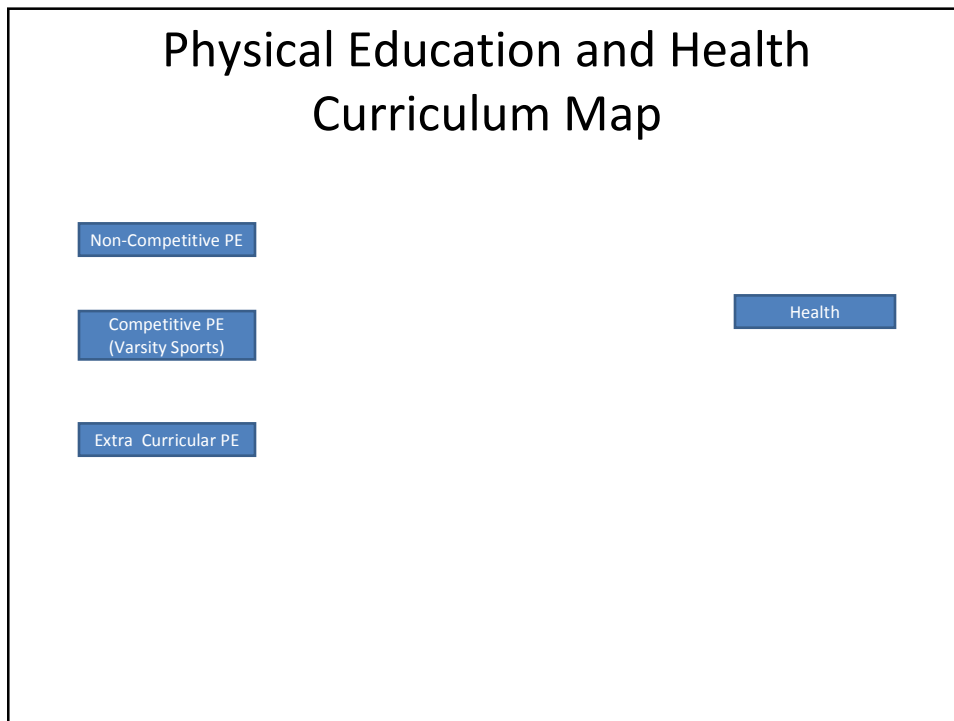
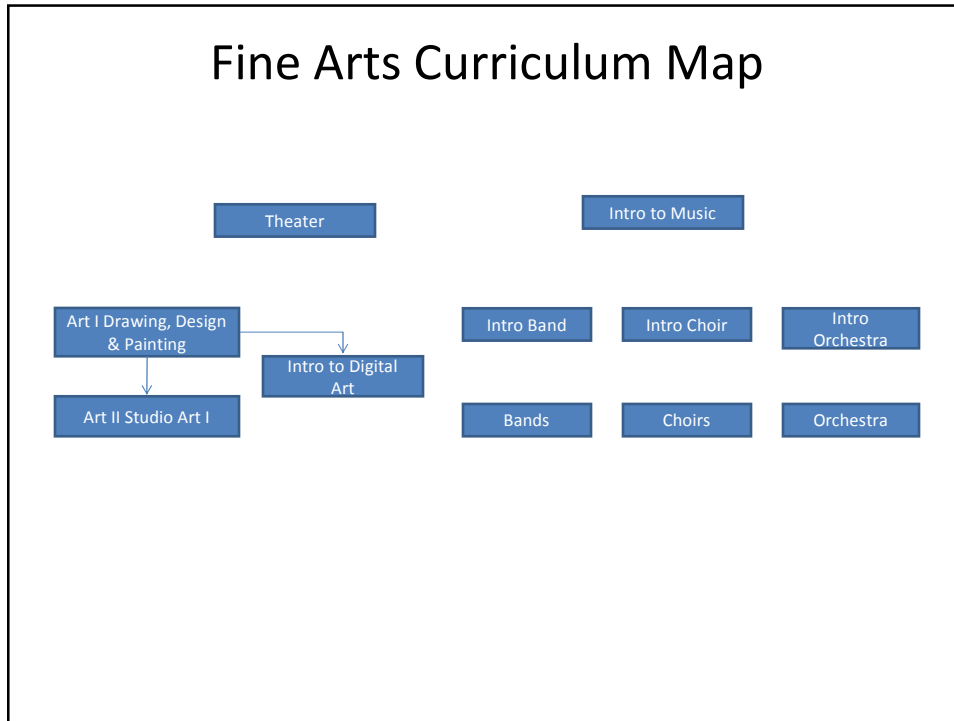
## Science & Technology Curriculum Map



## Language Arts Curriculum Map







## Math Courses

**Math 090: Pre-Algebra: 1 credit (elective).** Prerequisite: None. This course is designed to fill any gaps in students mathematical background and prepare them for further math courses. Topics shall include order of operations, variables, equations and inequalities of a single variable, absolute value, rules of exponents, basic probability and statistics, scientific notation, linear functions, basic geometry and polynomials. Additionally arithmetic facts, fractions, decimals and percents may be covered as needed.

**Math 100: Algebra I: 1 credit.** Prerequisite: Pre-Algebra. Operations with integers, evaluating and manipulating expressions, order of operations, exponents and notation, scientific notation, properties and axioms of algebra, equation solving, introduction to quadratic functions and quadratic formula, factoring, polynomials, graphing, probability. Students wishing to take Algebra II/Trig will require additional independent work.

**Math 150: Algebra I Honors: 1 credit. Weighted.** Prerequisite: Pre-Algebra and permission of instructor. For students needing little review of multi-step equation solving and order of operations. Topics similar to Math 100; more emphasis on factoring, radicals and radical expressions, introduction of complex numbers and right angle trigonometry. More emphasis on symbols and their manipulation rather than numbers.

**Math 200: Geometry: 1 credit.** Prerequisite: Algebra I. Introduction to the study of Euclidean Geometry with a review of Algebra concepts (especially equation solving and quadratics). Properties and theorems pertaining to points, lines, rays, polygons, circles, planes; congruence, similarity, parallelism and perpendicularity. Calculation of surface areas, perimeter, volume of plane and solid figures. Extension of basic trigonometry, Pythagorean Theorem, Coordinate Geometry, Triangle Inequalities. Introduction to methods of proof and construction.

## Math Courses

**Math 250: Geometry Honors: 1 credit. Weighted.** Prerequisite: Algebra I Honors or Algebra I with teacher recommendation. All topics of Math 200 with greater emphasis on proof (deductive and inductive reasoning). Additional topics include coordinate transformations, cylinders and spheres and a discussion of their coordinate systems.

**Math 300: Algebra II / Trig: 1 credit.** Prerequisite: Algebra I. Continuation and augmentation of topics from Algebra I. Extensive development of factoring techniques, elements of linear algebra through Cramer's Rule; curve fitting to function families; rational and radical equations, exponentials, logarithms and natural logarithms. Additional topics chosen from among: linear programming, vectors, conic sections, sequences and series, probability

**Math 350: Algebra II / Trig Honors: 1 credit. Weighted.** Prerequisite: Algebra I Honors, Geometry Honors or consent of instructor. Faster paced than Algebra II/Trig, students should be comfortable with substitution/elimination, graphing, basic factoring and basic quadratics. Topics include studies of the major function families: quadratic, exponential, rational, polynomial, logarithmic and natural log, trig functions and their inverses; theorems for the existence and determination of roots, linear programming, vectors, conic sections, sequences and series, probability. This course will include more topics than the standard, at a higher level of abstraction

**Math400: Pre-Calculus: 1 credit. Weighted.** Prerequisite: Algebra II/Trig. Review and further development of function families from Algebra II and their solution techniques, matrix algebra, conic sections and analytic geometry, 3 dimensional coordinate systems. Extensive work on circular functions, special angles, graphs, identities, equations, inverse trig functions, polar coordinates, right and oblique triangles.

## Math Courses

- Math 450: Pre-Calculus Honors: 1 credit. Weighted. Prerequisite:** Algebra II Honors or instructors permission. Students completing this course should have excellent preparation for either AP Calculus the following year. Extensive work with function composition and inverses, graphical and algebraic analysis of maxima, minima, bounds, zeros, intercepts, asymptotes, boundary behavior. Transformations, matrix algebra, conic sections, vectors and applications, trig functions, parametric equations and polar coordinates.
- Math 500: AP Calculus (AB): 1 credit. Weighted. Prerequisite:** Pre-Calc Honors or Pre-Calc and instructor recommendation. This course prepares students for the AP Calculus AB exam. The topics are as found in first semester college calculus: Notion, theory and computation of limits, functional analysis and basic integration. Some emphasis on theorems and their development.
- Math 510: AP Calculus (BC): 1 credit. Weighted. Prerequisite:** Pre-Calc Honors. This course prepares students for the Calculus BC exam. Topics covered are those found in the first two semesters of college calculus. All topics of AB Calculus plus improper integrals, infinite (geometric and power) series, parametric and polar coordinate curves. L'Hopitals Rule, applications of integrals and introduction to vector functions (div, grad, curl). Greater emphasis on theory and theorems.
- Math 520: AP Statistics: 1 credit. Weighted. Prerequisite:** Algebra II. A full year course intended to prepare students for the AP Statistics exam. Tools and concepts of statistics. Data collection and analysis, drawing conclusions. Four broad themes unite this course: 1) exploring data (graphically and algebraically), 2) planning a study or experiment, 3) anticipating patterns and using models (probability and simulation), 4) statistical inference (confirming the validity of models and experiments).
- Math 550: Discrete Math : .5 credit. Weighted. Pre-Requisites:** Pre-Calculus. Discrete math is the study of mathematical structures that are fundamentally quantized (discrete, separate, apart) as opposed to the continuous (smooth) nature of real and rational numbers. Integers, graphs/networks and logic are examples. This course should be of interest to future computer science and engineering majors as well as science and math students. Topics will include sets and formal logic topics, mathematical relations and functions on sets, mathematical models and algorithms, applications to finance and manufacturing operations.

## Science & Technology Courses

- Science 100: Biology I: 1 credit. Prerequisite:** None. Introduction to biology, topics include molecular and cellular structure and function. Cell organization and processes (fermentation, respiration, photosynthesis), heredity and evolution, genetics and evolution. Phylogenetic classification of plants and animals, reproduction, growth and development; environmental adaptation and specialization (structural, physiological, behavioral); ecology, populations, communities, ecosystems. Laboratories will illustrate key biological concepts with a focus on safety and good lab procedure, documentation and reporting.
- Science 150: Biology I Honors: 1 credit. Weighted. Prerequisite:** None. Topics covered are the same as in Biology I, but with greater rigor and depth.
- Science 200: Chemistry I: 1 credit. Prerequisite:** Biology and Algebra I. This introductory chemistry course will explore the structure of matter, chemical and physical change and processes, construct and utilize chemical equations, stoichiometry, periodic behavior of the elements and the construction of the Periodic Table, prediction of chemical and physical properties, acids, bases, thermodynamics and the rudiments of organic chemistry. Laboratories will illustrate key chemical concepts with a focus on safety and good lab procedure, documentation and reporting.
- Science 250: Chemistry I Honors: 1 credit. Weighted. Prerequisite:** Biology and Algebra I. Topics covered are essentially the same as Chemistry I, but with a greater emphasis on models, process and calculation. Additional topics from chemistry and biochemistry as time permits. Laboratories will illustrate key chemical concepts with a focus on safety and good lab procedure, documentation and reporting. Laboratories will illustrate key chemical concepts with a focus on safety and good lab procedure, documentation and reporting.

## Science & Technology Courses

- Science 300: Physics I: 1 credit. Prerequisite Chemistry I and Geometry. Physics is the study of matter, motion and energy. Topics will include Newtonian mechanics, temperature, heat, thermodynamics and kinetics, electricity, magnetism, waves, optics, atomic and nuclear physics. Additionally, the course will incorporate discussion of physics principles at work in daily life: microwaves, radio, television, airplanes; they all use physics! Laboratories will illustrate key physics concepts with a focus on safety and good lab procedure, documentation and reporting.
- Science 350: Physics I Honors: 1 credit. Prerequisites Chemistry I and Geometry. Faster paced and more rigorous (especially math) than Physics I. More focus on thought process, modeling and problem solving. Laboratories will illustrate key physics concepts with a focus on safety and good lab procedure, documentation and reporting.
- Science 410: AP Biology: 1 credit. Weighted. Prerequisite: Chemistry I. Equivalent to a two semester introductory college biology course. Topics include organismal biology, organisms and populations. Molecules, cells and biochemical pathways, heredity and evolution. Major organizing schema of energy transference, continuity, change and adaptation; relation of structure to function and systems regulation will be discussed and reinforced. Laboratories will illustrate key biological concepts with a focus on safety and good lab procedure, documentation and reporting. Students are expected to complete the AP exam.
- Science 420: AP Chemistry: 1 credit. Weighted. Prerequisite: Chemistry I, Algebra II/Trig (concurrent). Equivalent to a two semester introductory college chemistry course. Topics include structure and states of matter, reactions and equilibria, acids and basis, periodic behavior, thermochemistry, analytical techniques of separation and identification of chemicals; introduction to organic and biochemistry (time permitting). Laboratories will illustrate key chemical concepts with a focus on safety and good lab procedure, documentation and reporting. Students are expected to complete the AP exam.

## Science & Technology Courses

- Science 430: AP Physics: 1 credit. Weighted. Prerequisite: Physics I, AP Calculus (concurrent). Equivalent to a two semester introductory calculus based introductory physics course. Topics similar to Physics I, but with greater emphasis on the underlying mathematics and problem solving. Additional topics will include kinematics, dynamics, rotational mechanics, oscillation (mechanical and electrical), circuits, electromagnetism and nuclear physics. Laboratories will illustrate key physics concepts with a focus on safety and good lab procedure, documentation and reporting. Students are expected to complete the AP exam.
- Tech 100: Information Technologies: ½ credit. No Prerequisite. This course is a requirement for graduation, but may be waived for a more advanced course based on prior coursework or practical exam. General computer and information technology concepts. Computer architecture, the Internet, software and programming, ergonomic considerations and networks.
- Tech 200: Introduction to Computer Programming: ½ credit. No Prerequisite. Introduction to a computer programming language or development environment. Students will study the language and structures, and complete small programming assignments. A typical final project for this class would demonstrate the students understanding by requiring the development of an application or small game prototype.
- Tech 300: AP Computer Science AB: 1 credit. Prerequisites: Introduction to Computer Programming, Algebra II (concurrent), Discrete Mathematics helpful. This is a full year course in computer science analogous to that taught in college. Topics include program definition and design, implementation, control and logic structures, data and I/O handling, testing, debugging, algorithm development, numerical techniques, data structures (data types, records, arrays, lists, stacks, queues and trees), searching and sorting, list and tree operations, dynamic data structures; systems and networks, legal and ethical issues. Students in this class are expected to take the AP exam.

## Language Arts Courses

Language Arts 100: Classical Literature: 1 credit. Prerequisites: None. This year long course is a survey of early pivotal works in the Western tradition. First semester is primarily concerned with the works of the Greeks and their predecessors. Representative authors would include Homer, Sophocles, Euripides, Aristophanes, Plato, and Aristotle. Second semester will focus around the Romans and their successors. Representative authors would include Virgil, Horace, Ovid and Juvenal; possibly including related works by Shakespeare such as Julius Caesar or Anthony and Cleopatra. The course will organize around central questions of the human experience such as virtue, the meaning of being human, nobility. The course will include two longer papers requiring sustained analysis.

Language Arts 150: Classical Literature Honors: 1 credit. Weighted. Prerequisite: None. Similar to Classical Literature but with substantially more readings and papers.

Language Arts 200: British Literature: 1 credit. Prerequisites: Classical Literature or permission. A survey of canonical English Literature. Representative authors would include Chaucer, Shakespeare, Austen, Dickens and Milton. Throughout the course, students shall engage the authors and each other over key issues such as self, identity, free will, sacrifice and honor. This course will require several longer papers requiring sustained analysis.

Language Arts 250: British Literature Honors: 1 credit. Weighted. Prerequisites: Classical Literature or permission. Similar to British Literature but with substantially more readings and papers.

## Language Arts Courses

Language Arts 300: American Literature: 1 credit. Prerequisites: British Literature or permission. This course engages students in classics of American literature and how it speaks to us as a people. Representative authors would include Melville, Twain, Steinbeck, Whitman, Dickinson, Frost and Emerson. This course will require three to four substantial papers.

Language Arts 350: American Literature Honors: 1 credit. Weighted. Prerequisites: British Literature or permission. Similar to American Literature but with substantially more readings and papers.

Language Arts 400: Modern Literature: 1 credit. Prerequisites: Classical Literature. This course will be organized around several themes chosen by the instructor and supported by select readings from the span of written works. Substantial readings and papers throughout.

Language Arts 450: Modern Literature Honors: 1 credit. Weighted. Prerequisites: Classical Literature or permission. Similar to Modern Literature but with additional readings and papers.

Language Arts 460: AP Literature and Composition: 1 credit. Weighted. Prerequisites: 3 credits of Language Arts. Explicitly prepares students for the AP Literature and Composition exam administered by the College Board. Examination of works drawn from the AP reading lists; students shall write critically in response to those texts and themes. Students in this class are expected to take the AP exam.



## World Languages Courses

Latin/Spanish 100: 1 credit. Prerequisites: None. Introduction to the basic grammar and vocabulary needed to speak rudimentary Spanish (present and past tenses). Course will incorporate reading, writing, speaking, listening and culture. Students will develop from set phrases and words to more spontaneous and free form expression throughout the course.

Latin/Spanish 200: 1 credit. Prerequisites: Spanish 100 or equivalent mastery. Expansion and enhancement of skills learned in Spanish 100. Additional grammatical tenses and vocabulary. The majority of in class conversation will be in Spanish. Regular and irregular verbs, reflexiveness. Students should be able to read, write, speak and comprehend moderately difficult subjects that uses a variety of tenses and vocabulary.

Latin/Spanish 300: 1 credit. Prerequisites: Spanish 200 or equivalent mastery. Continued review and expansion of vocabulary and grammar. This course will complete the students introduction to all basic grammatical structure and vocabulary. Students should develop the capability for guided and independent reading for information acquisition rather than purely skills development.

Latin/Spanish 400: 1 credit. Prerequisites: Spanish 300 or equivalent mastery. Advanced language course meant to continue vocabulary and grammar fluency through speaking, listening, reading and writing assignments. Students will be expected to be able to read authentic, un-edited texts in the language. Examples would include novels, plays, poems, websites, newspapers, magazines.

Latin/Spanish 450: 1 credit. Weighted. Prerequisites: Spanish 400 or permission. Similar to Spanish 400, but at faster and at greater depth. Students in this class are expected to take the AP exam.

## Fine Arts Courses

Art 100: Introduction to Art: Drawing, Designing and Painting: ½ credit. Prerequisite: None. Introduction to artistic expression through the study of pictorial composition, proportion, space, shape and color. Study of materials relevant to artistic creation. Appreciation of artistic design and qualities through study of select masterworks.

Art 150: Introduction to Digital Art : ½ credit. Prerequisite: Introduction to Art. Students will develop digital photography skills and explore the use of various programs including Adobe Photoshop, Adobe ImageReady and Flash. Students will learn about the use of digital color, layers, text, backgrounds and graphics file creation and management.

Art 200: Studio Art I: ½ credit. Prerequisite: Introduction to Art. Continued study of the principles introduced in Introduction to Art. It includes a study of traditional and contemporary ways of drawing and painting as well as an analysis of color theory and pictorial space. Historical and modern critical opinions and their relation to problems in the theory of art are considered. Students will be expected to execute self-initiated projects.

Theater 100: Introduction to Theater: ½ credit. Prerequisites: None. Introduction to theater arts including types of plays and performances and the role of the actor. Students will learn about the structure and organization of working theaters and arts facilities, theater culture and vocabulary and etiquette.

## Fine Arts Courses

**Music 100: Introduction to Music:** ½ credit. Prerequisites: None. Primarily an introduction to the major forms of Western musical expression. Considers music and musicians from historical, cultural and political perspectives. Students will gain an appreciation of various genres and acquire basic tools for effective critical listening to music.

**Music 150: Introductory Choir:** 1 credit. Prerequisites: None. Intro Choir will study and perform a variety of choral repertoire including sacred, secular, folk and show tunes. Primary goals are the development of music reading, notating and listening skills in the context of a large group.

**Music 160: Introductory Band:** 1 credit. Prerequisites: Permission of Instructor. Intro Band will study and perform a variety of instrumental pieces from various periods and styles. Primary goals are the development of music reading, notating and performing in a small group.

**Music 170: Introductory Orchestra:** 1 credit. Prerequisites: Permission of Instructor. Intro Orchestra will study and perform a variety of instrumental pieces from various periods and styles. Primary goals are the development of music reading, notating and performing in a larger group.

## Social Sciences Courses

**History 100: World History:** 1 credit. Prerequisites: None. A general survey course of human history. First semester from the beginning of recorded history through approximately 1650. Second semester will consider from 1650 to the present. Areas of focus for this course include key influences which underpin the growth, expansion and decline of civilizations and cultures (trade, technology, environment, epidemics, colonization, travel, personal influence and warfare). Students will also be exposed to physical, cultural and economic geographic factors that have and can shape the development of a culture.

**History 150: World History Honors:** 1 credit. Prerequisites: None. Similar topics as World History but at greater depth, with more reliance on primary source material and more extensive writing and research.

**History 200: Human Geography:** ½ credit. Prerequisites: World History. Study of local and world regions, climates, ecosystems, population and environmental issues, cities, trade, natural hazards and geographic technology and thought processes.

**History 250: AP Human Geography:** ½ credit. Weighted. Prerequisites: World History and department approval. A systematic and rigorous study of the patterns, processes and technologies that have impacted human understanding, use of and alteration of the earth's surface. Studies of human social organization and environmental impact. Students in this class are expected to take the AP exam.

**History 220: American Government:** ½ credit. Prerequisites: World History. This course is a critical study of the essential documents of governance and the thought of the founding fathers. Theories of democracy and human nature (Locke, Rousseau), Declaration of Independence, U.S. Constitution, the bicameral system and balance of power between branches, between federal and state governments and between government and the state. Source reading from the founding fathers.

## Social Sciences Courses

History 270: AP American Government: ½ credit. Weighted. Prerequisites: World History. Topics covered are similar to History 220, but at greater depth and with additional readings and writing assignments. Students in this class are expected to take the AP exam.

History 300: U.S. History: 1 credit. Prerequisites: World History. An integrated approach to the events, people and influences that have shaped the United States, including, but not limited to geography, economics, politics and international relations. The course stresses how policies were determined, how conflicts were managed and how gender, race and cultural issues have impacted society. Major themes include contact between European settlers, Native Americans and African Americans, creation of the Constitution, major conflicts, territorial growth, relations between various cultures, key rulings of the Supreme Court and contemporary issues.

History 350: U.S. History Honors: 1 credit. Prerequisites: World History. Topics similar to U.S. History, but at greater depth and with an increased emphasis on primary source materials and additional writing.

History 400: World Religions: ½ credit. Prerequisites: World History. An intensive study of several of the world's major religions. Hinduism, Buddhism, Islam, Christianity, Judaism, Jainism, Sikhism, Sufism, Shinto, Confucianism, Taoism and indigenous religions. Students should be able to articulate the major beliefs, practices and significant historical events of each religion.

History 450: AP World History: 1 credit. Prerequisites: World History. Examination of human civilizations from earliest recorded time to the present. Study of key influences and drivers of civilization and culture. Attention to primary sources, extensive reading and writing. Students in this class are expected to take the AP exam.

## Physical Education and Health Courses

Physical Education 100: Non-Competitive Physical Education: ½ credit. Repeatable. Prerequisites: None. Class consists of a variety of sports and games and a fitness component. Course emphasis is on skills development, healthy living and fun. Examples of activities may include Frisbee, rock-climbing, jogging/running, weightlifting and resistance training, tennis and so forth.

Physical Education 150: Varsity Sports: ½ credit. Repeatable. Prerequisites: None. By prior arrangement with physical education department and a coach, students may earn PE credits through their participation.

Physical Education 160: Extracurricular Sports: ½ credit. Repeatable. Prerequisites: None. By prior arrangement with the physical education department, students may earn PE credits through participation through activities outside the school day. Examples include, but not limited to, martial arts, dance, gymnastics and so forth.

Health 100: Health and Wellness: ½ credit. Prerequisites: None. Students will acquire the knowledge and skills to recognize healthy lifestyle choices. Important topics to include nutrition, exercise, stress and stress management, drug and alcohol abuse and awareness, personal safety, limit setting and human sexuality.