



Alabama School of Mathematics and Science

Course Catalog

Revised: 10/18/2016

ASMS Mission Statement

To provide academically motivated Alabama students with exceptional preparation in the fields of math and science, empowering them to improve their community, state, and nation.

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Malcolm Donalson, Ph.D., Foreign Languages Professor Emeritus
Tim Grabill, M.M.E., Fine Arts Instructor
Ricky Green, B.S., Computer Science Instructor
Natalie Ortell, Ph.D., Biology Instructor

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Introduction

The courses described in these pages are applicable to the 2016-2017 school year. They have been designed to offer academic depth and diversity of content to accommodate the intellectual interest of both our students and the ASMS faculty. While every attempt will be made to accommodate students' interests, the actual slate of offerings in any quarter will be dependent on available staffing and minimum course enrollments.

The objective of the curriculum is to offer each student a thorough grounding in mathematics, science, and the humanities, to develop the skills and knowledge needed for future leadership roles in research, business, industry, and government.

In addition to the regular course offerings, the Alabama School of Mathematics and Science offers study options and special programs in the form of Directed Reading and Directed Research under individual faculty mentors. There is also an opportunity for experimental and experiential learning in the form of selected Special Projects. These Special Project offerings change with each academic year.

The specific minimum graduation requirements are described within. Each student must be registered for a minimum of five academic courses per quarter, although overloads may be taken with the permission of the academic counselor. In addition, each student must enroll in and successfully complete a Special Project each year that he or she is in attendance at the school.

Placement tests are employed in a variety of disciplines, including mathematics, biology, chemistry, and foreign languages, in order to determine appropriate course assignments.

Grading follows a letter evaluation system:

A	100-90	Excellent and Passing
B	89-80	Good and Passing
C	79-70	Satisfactory and Passing
D	69-60	Below Average and Failing
F	59-0	Poor and Failing
P		Passing
S		Satisfactory (an interim grade)
I		Incomplete
WP		Withdraw Passing
WF		Withdraw Failing
AUD		Audit
R		Repeat

Credit is awarded for courses successfully completed with a grade of "A," "B," "C," or "P." For courses that extend over more than one quarter, credit is awarded at the end of the sequence and an "S" on a report indicates satisfactory progress is being made.

Incompletes must be completed by midterm of the next quarter, or, in the case of spring quarter, by the last working day in June for juniors and sophomores.

Graduation Requirements

Courses completed prior to 9th grade will not be counted toward ASMS graduation requirements with the exception of Algebra or Geometry taken in the 8th grade. All requirements are stated in Carnegie Units (CU's). Specific graduation requirements are given below. However, students are required to also take 5.0 CU of additional coursework in order to complete the graduation requirements.

Biology: 1.5 CU

Chemistry: 1.5 CU

Computer Science: 0.5 CU

English: 4.5 CU

Fine Arts: 0.5 CU

Foreign Languages: 2.0 CU

History: 4.0 CU

Mathematics: 4.0 CU

Physical Education: 0.5 CU per year of enrollment at ASMS

Physics: 1.5 CU

Special Project: 0.25 CU per year of enrollment at ASMS

Student Orientation: 0.25 CU

Curriculum Summary

The following represents the standards that must be met in each student's studies at ASMS. While ASMS strives to provide a varied and individualized curriculum, only rare circumstances would allow for approval of any variation in the following requirements.

Biology: 1.5 CU graduation requirement. Minimum of 0.5 CU completed at ASMS.

- Students with no previous biology credit will take *Honors Biology I & II* followed by at least one 0.5 CU biology elective.
- For students entering with biology credit, a placement exam will be used to evaluate the appropriate starting level in the ASMS biology courses.

Chemistry: 1.5 CU graduation requirement.

- All students are required to complete either the entire *AP Chemistry* sequence, or *General Chemistry 1 & 2* followed by at least one 0.5 CU chemistry elective.
- Entering sophomores with no previous chemistry credit are required to take *Introductory Chemistry* before any other chemistry course.
- For students entering with chemistry credit, a placement exam will be used to evaluate the appropriate starting level in the ASMS chemistry courses. *Introductory*

Chemistry carries general elective credit and does not satisfy the 1.5 CU chemistry requirement.

Computer Science: 0.5 CU graduation requirement.

- *Computer Science: Principles* must be completed at ASMS. This course is generally completed during the first year of enrollment at ASMS.

English: 4.5 CU graduation requirement. Minimum of 1.0 CU completed during each year of enrollment.

- Sophomores must take Sophomore English and American Literature I. Juniors take Speech Communications, and they must also take either the two courses in our regular track, American Literature II and an English elective, or the year-long AP track, which includes three terms of AP English Language and Composition. Seniors choose between the two courses in our regular track, British Literature I and II, or the year-long AP track, which includes three terms of AP English Literature and Composition.

Fine Arts: Minimum of 0.5 CU taken at ASMS.

- *Survey of Art* or *Survey of Music* must be completed during the senior year at ASMS. Entering sophomores must complete 0.5 CU of either art or music during the sophomore year as a general elective credit.

Foreign Languages: 2.0 CU graduation requirement. Continuous enrollment until graduation requirement is completed in the preferred sequence.

- All students must complete the intermediate level of a language with 1.0 CU completed at ASMS.
- For all entering students wishing to pursue a language for which they already have some credit, a language placement exam will be used to evaluate the appropriate starting level in the ASMS language sequence.

History: 4.0 CU graduation requirement. Minimum of 1.0 CU during each year of enrollment.

- *Advanced American Studies 2/2* or *AP U.S. History* must be completed at ASMS during the junior year. Credits must include 1.0 CU in Western Civilization (World or European History), 1.0 CU in U.S. History, 0.5 CU in Economics, and 0.5 CU in Government.
- Incoming sophomores are required to complete *History of Western Thought* and *Advanced American Studies 1/2* during the sophomore year.

Mathematics: 4.0 CU graduation requirement. Continuous enrollment until graduation requirement is met.

- Credits must include *Trigonometry & Precalculus* and one 0.5 CU math course beyond *Precalculus*.
- For all entering students a math placement exam will be used to evaluate the appropriate starting level in the mathematics sequence. If Geometry has not been

completed prior to entering ASMS, it should be completed during the first year at ASMS.

Physical Education: 0.5 CU per year of enrollment in physical education or varsity sports; 0.5 CU graduation requirement in health.

- All students are required to take *Health* unless the course has already been completed prior to entering ASMS. This course does not count as an elective.

Physics: 1.5 CU graduation requirement. Minimum of 0.5 CU taken at ASMS.

- All students are required to complete an entire physics sequence at ASMS unless credit for a previous physics course is accepted by ASMS.
- All students with no previous physics credit are required to take *Introduction to Physics* during the junior year. *Introduction to Physics* carries general elective credit and does not satisfy the 1.5 CU physics requirement.

Special Project: 0.25 CU per year of enrollment at ASMS is required.

Student Orientation: 0.25 CU must be completed during the first quarter of enrollment.

Concentration

Concentrations in an academic area are awarded to students who complete three courses beyond the graduation requirement in a discipline. Each department is given the latitude of determining the courses that are appropriate for the concentration. Individual faculty members may recommend to the President/Director additional areas of concentration that they deem worthy of recognition.

Concentrations are designed to allow students to pursue an advanced plan of study primarily during their senior year; however, coursework may begin as early as the junior year. Students applying for a concentration must:

1. complete three (3) approved courses in the area of concentration (1.5 CU's),
2. complete all required courses approved for concentration with a grade of 'A' or 'B',
3. apply for no more than two (2) concentrations.

Students who successfully complete the above criteria are awarded a seal on their diploma signifying completion of the concentration. The final transcript will indicate the area(s) of concentration.

Course specific criteria are as follows:

Chemistry

To be awarded a Concentration in Chemistry, the student must complete 3 elective courses, as listed in the course catalog, beyond the three term chemistry requirement. Directed readings and directed research projects may not be used to satisfy the Concentration requirement.

Computer Science

A student must complete Advanced Placement Computer Science I, Advanced Placement Computer Science II, and Advanced Placement Computer Science III. The prerequisites for the Advanced Placement sequence are Java I, Java II, and Java III.

Fine Arts

Students wishing to earn a concentration in music or concentration with distinction in music or the performing arts must meet with the head of the Music Department no later than the beginning of the Spring term of their Sophomore or Junior year to declare their interest and verify the required courses.

Concentrations in music may be earned through either an instrumental or vocal track. Students are required to take Music Survey their senior year and play or sing in an ASMS band or choral ensemble for three terms of their Sophomore (if applicable), Junior, and Senior years. Credits for two of the terms are required. Credit earned from the third term may be applied toward a maximum of .5 CU of the concentration. Additional courses required are two terms of Music Theory.

A concentration in Visual Art requires AP Art 1-3 AR331, 332, 333.

Foreign Languages

Single Language Concentration (French, German, Latin, or Spanish) - 1.0 CU above the requirement in the single language, with an additional 0.5 CU in a course pre-approved by the respective instructors.

Foreign Language Concentration - 1.0 CU above the requirement in the first or a second language, with an additional 0.5 CU in a course pre-approved by the respective instructors.

Classics Concentration - Requirements must be met in a combination of history and Latin classes, with an additional 1.5 CU in history and/or Latin courses.

Mathematics

For a Concentration, a student must complete three (3) courses (1.5 CU) beyond Differential Calculus, at least one of which must be from the Calculus sequence. The Calculus sequence includes Integral Calculus, BC Calculus, Multivariable Calculus, and Differential Equations. For both Concentration and Distinction, the following requirements and restrictions apply: all grades in all math courses must be B or higher, and overall math GPA must be 3.6 or higher; no course except for a Directed Reading may count more than once (0.5 CU max), and a Directed Reading may count no more than three times (0.75 CU max); Computer Science courses do not count toward a concentration or distinction in Mathematics.

Concentration with Distinction

Students who complete a concentration have the option of taking three additional courses (1.5 CU's) of advanced study in the same area, which may or may not include independent study. The additional coursework must be approved by a faculty sponsor. By successfully completing these additional requirements with a 3.5 GPA, the student merits ***Distinction*** in an area, which will also appear on the diploma and transcript.

Course specific criteria are as follows:

Chemistry

To be awarded a Distinction in Chemistry, the student may choose from one of three options. The student may complete 6 elective courses beyond the three term chemistry requirement, or complete 5 elective courses and one 0.5 credit DR, or complete 4 elective courses and two 0.5 credit DRs.

Computer Science

A student must complete the requirements for a Concentration and take three Directed Reading courses in Computer Science. All grades in Computer Science courses must be B or higher.

Fine Arts

A Concentration with Distinction in Vocal Music is earned by taking a third term of Music Theory, and two of the following: Theatre Arts I, Jazz and the American Musical Theatre, two terms of voice, or enrollment in a second choral ensemble.

A Concentration with Distinction in Instrumental Music is earned by taking a third term of Music Theory, Jazz and the American Musical Theatre, and two terms in a second band ensemble.

A Concentration with Distinction in the Performing Arts is designed for the student who wishes to pursue advanced study in music and theatre. After completing a concentration in either vocal or instrumental music, three of the following are required; Theatre Arts I, Theatre Arts II, Theatre Production, or the Theatre Tech Directed Research.

A distinction in Visual Art requires in addition to the AP Art sequence: Survey of Art, Graphic Design, and completion of the AP Exam.

Foreign Languages

Single Language Distinction (French, German, Latin, or Spanish) - 2.5 CU above the requirement in a single language, with an additional 0.5 CU in a course pre-approved by the respective instructors.

Foreign Language Distinction - 2.5 CU above the requirement in the first or a second language must be met, with an additional 0.5 CU in a course pre-approved by the respective instructors.

Classics Distinction - Requirements must be met in a combination of history or Latin classes, with an additional 1.5 CU in history and/or Latin courses.

Mathematics

For a Distinction, a student must complete six (6) courses (3 CU) beyond Differential Calculus, at least two of which must be from the Calculus sequence. The Calculus sequence includes Integral Calculus, BC Calculus, Multivariable Calculus, and Differential Equations. For both Concentration and Distinction, the following requirements and restrictions apply: all grades in all math courses must be B or higher, and overall math GPA must be 3.6 or higher; no course except for a Directed Reading may count more than once (0.5 CU max), and a Directed Reading may count no more than three times (0.75 CU max); Computer Science courses do not count toward a concentration or distinction in Mathematics.

Courses

General Electives

GE100 Introduction to Linguistics .5 CU

This course is a one-term introduction to human language in general and gives an overview over most areas taught in college linguistics such as phonetics, phonology, morphology, discourse analysis, sociolinguistics, neurolinguistics and etymology. This course furthers self-awareness in English as well as a better understanding of the multi-layered interconnectedness of all languages. Coursework includes extensive use of a variety of online materials, including a school-owned website tailored entirely to this elective.

Prerequisites: None.

GE101 European and Scandinavian Studies .5 CU

The contemporary focus of this course is on the evolving influence and identity of an interconnected Europe in terms of the EU and the Eurozone. The course further provides a background on particular European and Scandinavian politics, societies and cultures. This course is collaborative in nature and will allow for joint, as well as individual, project-based exploration. Coursework includes extensive use of a variety of online materials, including a school-owned website tailored entirely to this elective.

This course may not be offered every year.

Prerequisites: None.

GE107 Mythology .5 CU

An introduction to world Mythology with emphases that can vary: Greek and Roman Myth, Egyptian, Hebrew, Hindu and Buddhist. Prerequisites: none.

GE125 Debate .5 CU

This course offers a survey of both competitive and informal debate formats, including the classic Lincoln-Douglas model. While the course will emphasize oral communication, students will be expected to write short essays, research papers, and briefs in preparation for the debates. Prerequisites: none.

GE129 Yearbook .5 CU

Yearbook teaches a variety of skills, including journalism, publishing, and photography. The end result is a yearbook that students will keep for years. Students plan, organize and design our yearbook, conducting interviews with faculty and fellow students and covering all aspects of school life in words and pictures. This elective is a two semester class.

Biology

BL101, 102 Honors Biology 1/2 - 2/2 .5 CU/quarter

This course is a two-quarter sequence in honors high school biology, entailing broad introductory coverage of biology including molecular biology, cell biology, genetics, organismal biology, population biology, ecology, behavior, biodiversity, and evolution. Laboratories are designed to reinforce the concepts introduced in lecture. The course is intended to supply an introductory biology for students who have not yet had an opportunity to take biology in high school. Prerequisites: Placement in this course is determined by performance on the biology placement exam.

BL210 Field Botany .5 CU

This course emphasizes the evolution, taxonomy and identification of vascular plants. Plants are studied in the context of major biomes and major local habitats. Students are required to sight identify important plant species, families, and divisions and to understand the ecological dynamics in local plant communities. This course has a heavy field emphasis, with weekly field trips to collect and study plants. One or more weekend field trips may be required. Prerequisites: Honors Biology or equivalent.

BL220 Ornithology .5 CU

Ornithology is the study of birds. Students study the classification, anatomy, physiology, biogeography, population biology, and behavior of birds. The laboratories are bird watching trips that emphasize species recognition. Students regularly visit nearby localities for the observation of birds. One or more weekend field trips may be required. Prerequisites: Honors Biology or equivalent.

BL303 Biological Diversity and Change .5 CU

A college-level study of biological diversity and the ecological, biogeographic, developmental, geological, taxonomic, anatomical, and molecular bases for the development of diversity over time, which comprises the science of evolutionary biology. Prerequisites: Honors Biology or equivalent, CH102 or higher.

BL305 Invertebrate Zoology .5 CU

Zoology is the branch of biology that deals with the study of animals. This course concentrates on the overwhelming majority of all animals, the invertebrates. It will introduce the underlying basic principles of zoology including animal classification, development, comparative morphology, and evolution. This course offers both field and laboratory experiences with animals. Prerequisite: Honors Biology or equivalent.

BL306 Vertebrate Zoology .5 CU

Zoology is the branch of biology that deals with the study of animals. This course will cover the taxonomic and anatomical diversity within the phylum Chordate. This course offers both field and laboratory experiences with animals including several dissections. Prerequisite: Honors Biology or equivalent.

BL307, 308 Human Genetics 1/2 (Introduction), 2/2 (Biotechnology) .5 CU/quarter

This course is a college-level study of the science of genetics. Term 1 will cover molecular, cellular, and Mendelian basis for inheritance and human genetic disease. Term 2 will emphasize understanding of the theoretical and practical foundations of modern genetics and introduce the student to major techniques of genetic technology. Prerequisites: Honors Biology or equivalent; CH102 or equivalent; permission of instructor.

BL310 Marine Biology .5 CU/quarter

The marine environment encompasses the majority of the Earth's biosphere and contains tremendous biological diversity. This one quarter course is an introduction to the common marine organisms of the ocean and examines the abiotic and biotic factors that influence their distribution and abundance. Topics include basic oceanography and ecology principles, the rocky intertidal zone, coral reefs, pelagic and deep sea communities and ocean conservation.

BL311, 312 Anatomy and Physiology 1/2 - 2/2 .5 CU/quarter

This two-quarter sequence encompasses the study of the macroscopic, microscopic, and physiological functions of systems of the human body. After an introduction to cell biology and cytology, students explore the structure and function of basic tissues and major organ systems of the body. Animal dissections, light microscopic examination of prepared sections, and physiological experiments supplement lectures. Prerequisites: CH102 or permission of instructor.

BL351, 352 Ecology 1/2 - 2/2 .5 CU/quarter

Ecology is the study of connections in nature. This two-quarter sequence studies the major sub-disciplines and theoretical foundations of ecology. Through the investigation of various habitats in Southern Alabama, students gain experience in conducting field research, data analysis, and writing and presentation of research results. The prerequisite for Ecology 1/2 is Honors Biology or equivalent; CH102 or equivalent; permission of instructor. The second quarter, when offered, is a focused concentration on a limited number of advanced topics. The prerequisite for Ecology 2/2 is Ecology 1/2 - BL351 or permission of the instructor. One or more Saturday field trips will be required per term.

BL381, 382, 383 AP Biology 1/3 - 2/3 - 3/3 .5 CU/quarter

This course is an intensive three-quarter, college-level sequence in biology, entailing broad coverage of the entire subject area including biochemistry, molecular biology, genetics, organismal biology, population biology, ecology, behavior, bio-diversity, and evolution. Laboratories include all or most of the recommended AP labs, plus additional laboratories of the instructor's choice. Students who complete the sequence with a cumulative grade of B or better may be encouraged to take the Advanced Placement Exam for Biology at the end of the academic year. Other sequences of courses may also enable the student to cover the AP Biology curriculum and students are encouraged to seek advice from the Biology Department. Prerequisites and corequisites: 1.0 CU of high school honors biology with a grade of A or B; Successful completion or concurrently taking CH102 or above; permission of instructor.

BL384, 385, 386 AP Environmental Science 1/3, 2/3, 3/3 .5 CU/quarter

This course is a three term interdisciplinary course. The course provides students with scientific principles, concepts, and methodologies to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving and/or preventing them. The course considers environmentally based issues such as pollution, habitat degradation, and resource conservation. This course requires a keen interest in issues concerning the welfare and sustainability of the earth. Many of the labs conducted will involve issues relating to pollution and energy. Prerequisites: Honors Biology or equivalent; CH102 or equivalent; permission of instructor. Students who successfully complete Ecology 1/2 (BL351) may use that course as a prerequisite for AP Environmental Science 2/3 (BL385).

BL400 Directed Research; Directed Reading .5 CU/quarter

Directed Research in biology involves intensive investigations in biology under the auspices of a biology faculty member who mentors a student's research. Students wishing to participate in a directed reading/research in Biology are usually expected to make a 3-quarter commitment. The biology faculty views the award of 0.5 CU/quarter of credit for independent study with the greatest seriousness. A student wishing to do a Directed Research must anticipate a substantial time commitment, averaging four to six hours per week, either on a weekly basis or in concentrated time periods such as week-ends. Modifications to these criteria may be considered on an individual basis.

Chemistry

CH090 Introductory Chemistry .5 CU

A one-quarter course designed to review and expand the math-based problem solving skills of sophomore students and to introduce some fundamental chemistry topics like atomic structure, stoichiometry, solutions, and pH. Problem solving requiring application of mathematical skills will be emphasized and will include the use of exponents, algebra, and log functions. Prerequisites: open to sophomore students only.

CH101, 102 General Chemistry 1/2 - 2/2 .5 CU/quarter

A two-quarter sequence providing a general survey covering the fundamentals of chemistry including, but not limited to, dimensional analysis, atomic structure, nomenclature, acid/base chemistry and reaction types. Prerequisites: None

CH201, 202, 203 AP Chemistry 1/3 - 2/3- 3/3 .5 CU/quarter

AP Chemistry is a three term sequence designed to introduce the student to current theory and practice in Chemistry and to prepare the student to take the Advanced Placement (AP) Chemistry Test. Topics which are discussed include the structure of atoms and molecules, reactions in aqueous solutions, thermodynamics, and stoichiometry. Prerequisites: CH090, CH101/102 or passing score on qualifier.

CH204 Advanced General Chemistry .5 CU

A one-quarter chemistry elective designed for students who wish to pursue further studies in chemistry. It expands the student's background in the fundamental laws, facts, principles and applications of chemistry. Topics which might be covered include Lewis Structures, models of covalent bonding, colligative properties of solutions, REDOX Reactions, chemical kinetics, chemical equilibria, thermodynamics, electrochemistry, nuclear chemistry. Prerequisites: CH102 or a passing score on qualifier.

CH215 Environmental Chemistry .5 CU

This course is designed to expand the student's background in chemistry. It is a one-quarter course focusing on the environmental chemistry. It will include discussions about air, water, energy, plastics, drugs, and nutrition. Prerequisite: CH102 or a passing score on the qualifier.

CH301 Inorganic Chemistry .5 CU

This one quarter chemistry elective is designed for students to have a strong interest in chemistry. This course will expand the student's background in chemistry, focusing on the properties and reactions of the elements other than carbon. Topics presented may include symmetry operations, ionic & covalent bonding, 3-D molecular structures and crystal packing. Prerequisites: CH102 or CH202, or a passing score on qualifier. This class is not offered every year.

CH303 Introduction to Organic Chemistry .5 CU

A one-quarter chemistry elective designed for students who have a serious interest in chemistry and/or the life sciences. This course covers fundamental topics such as functional groups, nomenclature, isomers, structure/physical property relationships and reaction types. Prerequisites: A grade of "B" or better in CH101, 102, completion of CH201, 202, 203 or permission of the instructor.

CH306 Introduction to Biochemistry .5 CU

Establishes a foundation in the broad field of biochemistry. The structured-function relationship of proteins, enzymes, carbohydrates, lipids and nucleic acids will be discussed in class and explored in the laboratory. The metabolism of carbohydrates and lipids will be included. Prerequisites: A grade of "B" or better in CH101, 102 or CH201, 202, 203. Completion of CH303 and BL102 is recommended.

CH307 Organic Chemistry .5 CU

A one-quarter chemistry elective for students who have a strong interest in chemistry or the life sciences. This course builds on the material covered in CH303 and provides a more in-depth study of the chemistry of organic compounds. Reactions of each functional group will be studied with an emphasis on 3-D structures and reaction mechanisms. Topics will include molecular models, compound & reaction stereochemistry, and multi-step synthesis. Prerequisites: CH303 or permission of the instructor.

CH400 DR: Pyrotechnics 0.25 or 0.5 CU

An introduction to the specific chemistry and careful technique involved in the safe production of fireworks and pyrotechnic effects like noise, light and colors. Prerequisites: completion of CH102 or CH202 and permission of the instructor.

CH400 DR: Spectroscopy 0.25 or 0.5 CU

The Spectroscopy course will introduce the student to spectrometric techniques such as Mass spectroscopy (MS), InfraRed spectroscopy (FTIR) and Nuclear Magnetic Resonance (NMR) spectroscopy. Students will gain knowledge of the theory of spectroscopy and structure elucidation. Prerequisites: completion of CH303 and CH307 and permission of the instructor.

Computer Science

CS101 Computer Science: Principles .5 CU

Computation has changed the way people think, work, live, and play. Our methods for communicating, collaborating, problem solving, and doing business have changed and are changing due to innovations enabled by computing. Many innovations in other fields are fostered by advances in computing. Computational approaches lead to new understandings, new discoveries, and new disciplines. Students in this course will become familiar with many ways in which computing enables innovation, and they will analyze the potential benefits and harmful effects of computing in a number of contexts. Prerequisites: none.

CS114 Introduction to Programming with Alice .5 CU

Programming concepts are introduced in a drag-and-drop environment called Alice that is currently updated and maintained at Carnegie Mellon University. Some of the concepts covered are classes, objects, expressions, parameters, methods, conditionals, iteration, concurrency, and events. Students learn to make movies that are animations of objects based on an existing library that can be extended in different ways by each student. Manipulation of objects in 3D space is both an objective in creating certain animations and a tool that lends insight into how computer software is engineered. Prerequisites: none.

CS116 Introduction to Programming using Python .5 CU

Programming concepts are introduced in this Python course. The pace of the course is designed to lead to mastery of each of the topics discussed in class. Simple data analysis will be used as the programming exercises through the course. The course will focus on planning and organizing programs, as well as the grammar of the Python programming language. Topics include language components, the IDLE environment, control flow constructs, strings, I/O, collections, classes, modules, and regular expressions. You can do the programming assignments for the class using a web browser or your personal computer. Text book and materials will be provided. Prerequisites: None

CS210 Database Design & SQL (Structured Query Language) .5 CU

Database Design and SQL (Structured Query Language) will be introduced in this course using relational databases. Students will be introduced to a history of database management covering hierarchical, network, relational and object oriented models with a focus on the relational model and its operators. Students will be presented with a methodology for relational database design using Entity Relationship Diagrams and normalization of data. Students will also be introduced to a subset of SQL using an on-line SQL interpreter. An overview of the functions of the Database Management System (DBMS) and of a Database Administrator (DBA) will also be presented. Text book and materials will be provided.

Prerequisites: CS101 and CS114, CS116, or some other programming language

CS216 **C#** **.5 CU**

Students learn the integrated development environment for C# that includes drag and drop creation of forms. IntelliSense is used to introduce students to event driven programming. An analysis will be done of the play Hamlet. Prerequisites: none.

CS311, 312, 313 **Java 1/3 - 2/3 -3/3** **.5 CU/quarter**

Java is a three-quarter sequence that includes compilation of programs and applets, variables, types, operators, assignments, algorithms, syntax, software development, style, Boolean expressions, conditional statements, methods, constructors, fields, iterative statements, arrays and classes. Prerequisites: none.

CS321, 322, 323 **AP Computer Science 1/3 - 2/3 -3/3** **.5 CU/quarter**

Topics include programming methodology, software engineering, blocks, data types, control structures, methods, recursion, text files, arrays, encapsulation, inheritance, polymorphism, data abstraction, searching algorithms, sorting algorithms and the AP case study. This course targets juniors or seniors with a 'B' or above average. Students are expected to take the AP Computer Science Exam in the spring. Prerequisites: Prerequisites: CS311, CS312, and CS313.

English

EN091 Sophomore English .5CU

An introductory course in critical thinking, reading and writing, this course teaches students how to analyze both ideas and texts and how to communicate that analysis in clear, coherent prose. Various rhetorical strategies will be followed, and texts from a variety of areas will be studied. Emphasis is placed on the writing process itself: planning, execution, and revision. Students will also learn to evaluate the quality of sources on the web and in print. Required for Sophomores. Prerequisites: none.

EN092 American Literature I .5 CU

This course in critical thinking and writing, required for Sophomores, is equivalent to a college-level course in composition and literature, and uses 19th Century American Literature as a point of reference. Students learn how to analyze texts and translate their ideas into the form of the standard college essay. Prerequisites: EN091.

EN101 American Literature II .5 CU

This course, required for Juniors, covers American literature published after 1900. Students will develop analytical skills and polish their writing techniques through research assignments that ask them to cite reliable web resources as well as print articles and scholarly books to support their own interpretations of American literary works. Prerequisites: none.

EN120, 121, 122 AP English Language and Composition .5 CU/quarter

The AP English Language and Composition course focuses on rhetorical analysis of nonfiction texts and the development and revision of thoughtful, evidence-centered, analytical and argumentative writing. Students in this introductory college-level course read and carefully analyze a broad and challenging range of nonfiction prose selections, deepening their awareness of rhetoric and how language works. Through close reading and frequent writing, students develop their ability to work with language and texts with a greater awareness of purpose and strategy, while strengthening their own compositional abilities and awareness as writers. Course readings feature expository, analytical, personal, and argumentative texts from a variety of authors and historical contexts. Prerequisites: Junior year.

EN201, 202 British Literature 1/2 - 2/2 .5 CU/quarter

This two-term sequence is a college-level British literature survey covering major works and authors from the Old English period through the 21st century. Historical background and critical interpretation of works of poetry, drama, and prose are to be emphasized through web research and consultation of online databases. Further development of analytical writing techniques will take place through both short and long interpretive essay assignments. Prerequisites: EN 101 and one English elective in Junior year.

EN204 Journalism .5 CU

Students will study the fundamental principles of gathering, writing, reporting, and editing the news. Emphasis will be placed on accuracy, brevity, clarity and reportorial responsibility. Discusses the relationship between the media and society throughout history and the influence of one on the other. Explores various theoretical approaches to understanding and explaining the communication process and how it affects society. Prerequisites: None.

EN206 Critical Analysis of Film .5 CU

An introductory course in the analysis of film as a means of story-telling through the use of dramatic and pictorial technique. The only truly new art form since the dawn of history, the movies have shaped modern culture in remarkable ways. We will watch and discuss an array of American movies, representing a variety of genres, for both their literary qualities of character and theme, and the techniques of directing, acting and cinematography that produce them. Prerequisites: none.

EN207, 208, 209 AP English Literature and Composition .5 CU/quarter

The course is intended to prepare students wishing to take the AP English Literature exam. It will cover the more comprehensive AP reading list as well as train them for the particular tasks required by the standardized test itself. The course is a yearlong commitment with a third quarter that will be counted towards an English concentration. Students will also work with online scholarly databases to compose college-level research essays. The reading load is heavy; as a result, students are asked to sign up before the summer break so that they will be able to prepare. Prerequisites: Senior standing and permission of instructor.

EN211 Shakespeare on Stage .5 CU

This course is an approach to Shakespeare that combines literary analysis with dramatic performance. Characters and ideas will be studied, but so will their dramatic interactions, by taking key scenes and enacting them as well as reading them. Five plays will be selected from such favorites as *Hamlet*, *A Midsummer Night's Dream*, *Macbeth*, *As You Like It*, *Julius Caesar*, *Romeo & Juliet*, *The Taming of the Shrew*, *1 Henry IV*, *Twelfth Night*, *Much Ado About Nothing* and *Richard II*. Prerequisites: none. Recommended for second term Sophomores and above.

EN217 Gothic Studies: Gothic Literary Classics and their Interdisciplinary Contexts .5 CU

This course will survey classic works of Gothic Literature from the 19th century, while also exploring some of the historical, social, artistic, and even scientific and economic contexts of those classic texts. The course will include an exploration of classic film versions of these Gothic texts that were produced and released in the early 20th century. Therefore, this course will not only explore the original versions of classic works of Gothic literature and film, but it will also reveal some of the interdisciplinary origins and contexts of these Gothic classics that **contributed** to the still popular forms of the Gothic that students are more familiar with in current popular culture. Texts will include Mary Shelley's *Frankenstein* (1818), Robert Louis Stevenson's *The Strange Case of Dr. Jekyll and Mr. Hyde* (1886), Oscar Wilde's *The Picture of Dorian Gray* (1891), and Bram Stoker's *Dracula* (1897). Film versions and adaptations will include

Nosferatu (1922), Dracula (1931), Frankenstein (1931), Dr. Jekyll and Mr. Hyde (1931/1941), and The Picture of Dorian Gray (1945). Prerequisites: none.

EN220 Creative Writing .5 CU

This course develops a student's talent in writing short stories and poetry. The workload includes regular exercises and assignments. Besides writing their own creative pieces, students will analyze literary works. Prerequisites: EN101.

EN221 Advanced Prose Writing .5 CU

This course presents advanced techniques of prose for students with professional journalistic ambitions, or students who simply wish to improve papers and style. Emphasis is on style, rhetoric, and rhythm, as well as clear, hard, imaginative thought. Weekly writing assignments are required. Prerequisites: EN101.

EN223 Satire Writing .5 CU

Satire is arguably the most difficult form of writing to master; it requires a thorough understanding of argumentation and essay writing strategies, the specific issue for discussion, and how humor actually works (which is much more difficult than many imagine). This class will be a study of all three of these topics and how they work together to produce a satirical piece of writing. The course will begin with a review of argumentation and research strategies before moving on to study the tools of satire, including irony, parody, exaggeration, hyperbole, and more. We will also discuss the importance of satire in western culture and the impact it has had historically and today by examining classic pieces of satire such as Jonathan Swift's "A Modest Proposal" and modern examples like "Last Week Tonight" and "The Daily Show". This is a writing intensive class.

EN222 Chaucer and the Road to Canterbury .5 CU

What do we learn when we join Chaucer's motley crew as they ride from Southwark down to the great cathedral? We learn, among other things, what it means to be a knight, a fiercely independent widow, a religious con-man, a physician in a time of plague, a smuggler, a businessman who is also a monk, a bigoted prioress, a handsome young squire, a wealthy landowner, a crooked miller, a religious cop who practices extortion and a number of others. Hierarchy, chivalry, religious controversy, marriage, the role of women, the plague and politics are among the topics that they discuss – and so will we. Students will use online databases to research historical topics pertaining to the literature, and they will use web texts to contrast Chaucer's Middle English with our own Modern English.

Prerequisites: none; recommended for second term Sophomores and above.

EN225 Discovery and Conflict .5 CU

This course attempts to define tradition and change as they relate to human nature and hence to civilizations. A cross-disciplinary approach will examine three major scientific discoveries and their consequences, including ideological wars and the "threat" of

science. Texts will include both scientific sources and fiction, and an interdisciplinary team of teachers will help teach various units. Grades, in general, will be accorded through analytical papers and projects. Prerequisites: Senior status.

EN229 Victorian Women's Studies (Cross-Reference English/Women's Studies) .5 CU

This course explores Victorian women's thoughts and feelings as evinced in their writings as well as their own lives. Students will explore class distinction/birthright and gender in relation to the design of a woman's life as well as the pull of duty and family obligation. Prerequisites: none.

EN230 The Philosophical Background of Literature .5 CU

The course introduces the student not only to the various important schools of literature (and art), from Platonic to Romantic to Post-Modernist, but serves as a basic introduction to the ideas and disciplines of philosophy itself. The student will therefore a) practice philosophizing by asking and answering the great questions of humanity and b) learn to apply this foundational knowledge in philosophy and ideas to the understanding of literature as art. Prerequisites: EN 092.

EN231 Classics of World Film .5 CU

We will study movies by some of the greatest directors from around the world – including such figures as Bergman (Sweden), Kurasawa (Japan), Lang (Germany), Reed (UK), Truffaut (France), Da Sica (Italy), Bunuel (Spain) Eisenstein (Russia), Coppola (US), and others. The nature of the story told, and how it reflects both universal human concerns, and the more specific ideas of the culture and the director, will be discussed. Prerequisites: none.

EN237 Brave New Worlds: The Dystopian Novel .5 CU

Long before the Fallout video game franchise exposed players to its dark vision of an America gone wrong, there existed the dystopian novel, a literary genre devoted to alternate histories in which oppressive or depraved governments seize control and terrorize their citizens. Contemporary examples of dystopian fiction include the books in Suzanne Collins's The Hunger Games series, but this course will focus more on the foundations of the genre, beginning with the utopian discourses of Plato and Sir Thomas More, proceeding to the nineteenth-century semi-dystopia of Charles Dickens's Hard Times, and then moving on to the dystopian environments envisioned by Aldous Huxley and George Orwell. Students will also engage with online readings of short stories and analytical articles. The assigned essays will explore what political and social change creative writers seek to advance when they let their dark imaginations run wild. Prerequisites: none.

EN238 Constructs of Self .5 CU

This course will explore constructs of self and representations of identity through and within the lens of contemporary literature. The purpose of this course is to challenge students to attempt to unravel a multiplicity of identifications (cultural, social, socio-economic, gender, etc.) and explore the ways in which identity (the "self") is appropriated. Students will also consider such representations in film adaptations of particular texts. Prerequisites: none.

EN239 **Speech Communications** **.5 CU**

This course, required for Juniors, introduces students to the fundamentals of public speaking while also helping them further develop their written communication skills. Students will use digital media to make presentations and projects that engage their audiences. Prerequisites: none.

EN240 **Advanced Speech Communications** **.5 CU**

In this course, students will further cultivate the skills acquired in Speech Communications as they prepare and deliver multimedia presentations on contemporary issues, their studies at ASMS, and, if applicable, their ongoing research projects. The coursework is intended to professionalize students by molding them into confident communicators. Prerequisites: EN239.

Fine Arts

AR102 Graphic Design and Computer Graphics 1/2 .5 CU

This course introduces students to methods of communicating and interpreting visual information. Through a series of lectures and problem-solving exercises, using the latest graphic design computer software, students learn to communicate visual information clearly and in innovative ways. In addition, students briefly study the history of type forms and their usage. Upon completion of this class, students understand design techniques used in advertising and television, and are able to employ those same techniques to generate presentations that can be used in any visual media.

Prerequisite: none.

AR106 Painting .5 CU

This course presents the fundamental techniques of painting. Using a wide range of problem solving exercises, students learn about preparing various surfaces, using painting tools, mixing colors and analyzing surface qualities. The integration of drawing and design concepts is emphasized as students investigate color-value relationships, the articulation of form, composition and symbolic formal relationships. Working primarily from observation, students explore subjects ranging from still life, interiors, landscapes, cityscapes, self-portraits and the figure. Prerequisite: none.

AR107 Drawing 1/2 .5 CU

This course is for beginning through advanced students in drawing. It will introduce technical and conceptual devices artists have traditionally used in representing appearances and ideas. Course sections will deal with basic design principals, gesture drawing, contour drawing, value drawing, linear and atmospheric perspective, and thematic development. Prerequisite: none.

AR108 Ceramics I .5 CU

This course gives students the opportunity to learn basic ceramic skills using clay and glaze materials and to foster those skills to develop creative thinking. Students will learn hand-building techniques, practice on the potter's wheel and work with a variety of clay surface designs. Prerequisite: none.

AR109 Sculpture .5 CU

A beginning sculpture course which covers the techniques, materials and concepts of three-dimensional design through projects using fibers/textiles, plaster, clay, wood, and metals. Formal design concepts will be emphasized as students investigate color and value relationships, the articulation of form, composition, and symbolic formal relationships. In addition, the course will address contemporary issues related to sculpture and design. Prerequisite: none.

AR110 Studio Art .5 CU

Studio Art is a general introductory Visual Arts course. Students elect to work in one of the available areas of study in the Art Studio. Assignments in this class are introductory exercises designed to develop basic skills and a foundation for further studies in the

Visual Arts. This course is half the normal class time. Full .5 credit is acquired over two terms. This course was created to make the Art Studio accessible to students with demanding schedules or involved in athletics.

AR112 Graphic Design and Computer Graphics 2/2 .5 CU

This course is an extension of the material covered in course one. Students will learn vector-based drawing, three-dimensional modeling and rendering, and animation. Advanced topics in two-dimensional design will be covered through problem solving projects and lectures. Prerequisite: AR102.

AR117 Drawing 2/2 .5 CU

This course is for more advanced students in drawing. It will further develop an understanding of technique and design concepts learned in Drawing 1. Contemporary issues related to aesthetics and thematic development will be emphasized. Prerequisite: AR107 or a portfolio review.

AR118 Ceramics II .5 CU

This course gives students the opportunity to learn basic ceramic skills using clay and glaze materials and to foster those skills to develop creative thinking. Students will learn hand-building techniques, practice on the potter's wheel and work with a variety of clay surface designs. Prerequisite: AR108.

AR120 Introduction to Photography .5 CU

This course introduces students to the history, techniques, and design elements of photography. Specific emphasis will be placed on the study of photography as an art form. A brief introduction to the history of photography will lead to an in depth study of various types of cameras, composition, color theory, lighting, scanning, image editing, and printing. Some critical writing related to the formal analysis of design and personal expression will be expected. Through selected readings students will also be expected to become familiar with current trends in photography and art. Students may use either film or digital cameras. Image editing and printing will be done with computers. Prerequisite: none.

AR121 Advanced Digital Photography .5 CU

This course introduces students to digital photography, digital media editing and the principles of 2D design. Through a series of lectures and hands-on exercises students will learn and use all of the functions and menu items of a typical digital SLR. The software used in the class will be Adobe Photoshop and Adobe Camera Raw. Topics include: camera and lens functions, media storage, file types, exposure, white balance, design, natural lighting, artificial lighting, image editing, printing and display. Upon completion of this class students should be able to take professional looking photos and know how to properly prepare them for use in printed or digital media. The course will consist of tests, assignments and hands-on evaluations. Prerequisite: none.

LF101, 102 Beginning French 1/2 - 2/2 .5 CU/quarter

Emphasis is placed on the acquisition of basic language skills: oral and aural skills, reading, and writing. Cultural learning is integrated continually in all aspects of language acquisition. Students learn foundational pronunciation, a basic vocabulary and the simple grammatical constructions needed for essential communication. Coursework includes extensive use of a variety of online materials, including a school-owned website tailored entirely to these learners.

Prerequisite LF 101: None. LG 102: Successful completion of LG 101 or demonstrated comparable competence.

LF201, 202 Intermediate French 1/2 - 2/2 .5 CU/quarter

This two-quarter course further develops listening, speaking, reading and writing skills, enabling students to successfully communicate in everyday situations and completing a comprehensive grammar foundation. Cultural learning is integrated continually in all aspects of language acquisition. Individualized creative expression is encouraged. Coursework includes extensive use of a variety of online materials, including a school-owned website tailored entirely to these learners.

Prerequisite LF 201: Successful completion of LF102 or demonstrated comparable competence. LF 202: Successful completion of LF 201 or demonstrated comparable competence.

LF301, 302 Advanced French 1/2 - 2/2 .5 CU/quarter

This two-quarter sequence rounds out a comprehensive foundation in all areas of French grammar and focuses on communicative competence and personalized creative expression. This course is increasingly conducted in French. Cultural learning is integrated continually in all aspects of language use. Coursework includes extensive use of a variety of online materials, including a school-owned website tailored entirely to these learners.

Prerequisite LF 301: Successful completion of LF201 or demonstrated comparable competence. LF 302: Successful completion of LF 301 or demonstrated comparable competence.

LF401, 402, 403 Fourth Year French 1/3 - 2/3- 3/ 3 .5 CU/quarter

This three-quarter sequence is intended for those students who wish to develop proficiency across interpersonal, interpretive and presentational communication modes, and immersing themselves in the language right up until graduation. Reinforcing the foundational grammar of previous courses, the communicative approach of this course serves to broaden vocabulary and expose learners to multiple communication styles from current authentic text, audio and video sources. Coursework includes extensive use of a variety of online materials, including a school-owned website tailored entirely to these learners. Motivated learners may opt to take the AP French Exam in May.

This course may not be offered every year.

Prerequisite: LF302, or demonstrated comparable competence.

LF460, 461, 462 Readings in French .25 - .5 CU/quarter

A conversational immersion directed reading for independent advanced learners offers further experience with a variety of French literature. This course is held entirely in French. This course may not be offered every year.

Prerequisites: LF302, or demonstrated comparable competence.

LF501, 502, 503 Fifth Year French 1/3, 2/3, 3/3 .5 CU/quarter

This high level immersion course is intended for those students who wish to perfect their proficiency across interpersonal, interpretive and presentational communication modes, and maintain fluency in the language right up until graduation. Students may additionally pursue individual areas of literary exploration. Coursework includes extensive use of a variety of online materials, including a school-owned website tailored entirely to these learners. Motivated learners may opt to take the AP French Exam in May.

This course may not be offered every year.

Prerequisites: LF403 or demonstrated comparable competence.

LG101, 102 Beginning German 1/2 - 2/2 .5 CU/quarter

Emphasis is placed on the acquisition of basic language skills: oral and aural skills, reading, and writing. Cultural learning is integrated continually in all aspects of language acquisition. Students learn foundational pronunciation, a basic vocabulary and the simple grammatical constructions needed for essential communication. Coursework includes extensive use of a variety of online materials, including a school-owned website tailored entirely to these learners.

Prerequisite LG 101: None. LG 102: Successful completion of LG 101 or demonstrated comparable competence.

LG201, 202 Intermediate German 1/2 - 2/2 .5 CU/quarter

This two-quarter course further develops listening, speaking, reading and writing skills, enabling students to successfully communicate in everyday situations and completing a comprehensive grammar foundation. Cultural learning is integrated continually in all aspects of language acquisition. Individualized creative expression is encouraged. Coursework includes extensive use of a variety of online materials, including a school-owned website tailored entirely to these learners.

Prerequisite LG 201: Successful completion of LG102 or demonstrated comparable competence. LG 202: Successful completion of LG 201 or demonstrated comparable competence.

LG301, 302 Advanced German 1/2 - 2/2 .5 CU/quarter

This two-quarter sequence rounds out a comprehensive foundation in all areas of German grammar and focuses on communicative competence and personalized creative expression. This course is increasingly conducted in German. Cultural learning is integrated continually in all aspects of language use. Coursework includes extensive use of a variety of online materials, including a school-owned website tailored entirely to these learners.

Prerequisite LG 301: Successful completion of LG201 or demonstrated comparable competence. LG 302: Successful completion of LG 301 or demonstrated comparable competence.

LG401, 402, 403 Fourth Year German 1/3 - 2/3 - 3/3 .5 CU/quarter

This three-quarter sequence is intended for those students who wish to develop proficiency across interpersonal, interpretive and presentational communication modes, and immersing themselves in the language right up until graduation. Reinforcing the foundational grammar of previous courses, the communicative approach of this course serves to broaden vocabulary and expose learners to multiple communication styles from current authentic text, audio and video sources. Coursework includes extensive use of a variety of online materials, including a school-owned website tailored entirely to these learners. Motivated learners may opt to take the AP German Exam in May.

This course may not be offered every year.

Prerequisite: LG302, or demonstrated comparable competence.

LG460, 461, 462 Readings in German .25 - .5 CU/quarter

A conversational immersion directed reading for independent advanced learners offers further experience with a variety of German literature. This course is held entirely in German. This course may not be offered every year.

Prerequisites: LG302, or demonstrated comparable competence.

LG501, 502, 503 Fifth Year German 1/3 -2/3 - 3/3 .5 CU/quarter

This high level immersion course is intended for those students who wish to perfect their proficiency across interpersonal, interpretive and presentational communication modes, and maintain fluency in the language right up until graduation. Students may additionally pursue individual areas of literary exploration such as the classical period (Goethe, Schiller), romanticism (Novalis, Eichendorff), “between wars” literature (Brecht, Tucholsky), expressionism and modernity (Rilke, Kafka), „rubble” literature (Borchert, Böll) or current youth and adult literature. Coursework includes extensive use of a variety of online materials, including a school-owned website tailored entirely to these learners. Motivated learners may opt to take the AP German Exam in May.

This course may not be offered every year.

Prerequisites: LG403 or demonstrated comparable competence.

LG400 Program Abroad: Germany .25 - 1.5 CU/quarter

This cultural immersion program is designed for qualified students of German. During the ASMS fall term, participants reside with a host family in the town of Münster and attend the *Gymnasium Paulinum*, the oldest high school in Germany. They share breaks and vacations with their hosts who may take them to different places around Germany or even Europe. Simultaneously, matched German students attend ASMS and reside at ASMS, while also being hosted by their American families during breaks and weekends to enjoy American family life and get to know the US as much as possible.

Qualified and interested students should consult the school-owned website tailored uniquely to our long-standing Germany Visits and consult with school counselors and the program’s sponsor at the beginning of the school year. Annual deadlines apply.

Prerequisite: Permission of the program’s sponsor and the school administration.

Elective credit for up to 1.5 credits will be determined upon return by sponsor.

LS101, 102 Beginning Spanish 1/2 - 2/2 .5 CU/quarter

Emphasis in this two-quarter sequence is placed on the acquisition of basic language skills: oral and aural skills, reading, and writing. Level appropriate cultural topics are presented throughout the term. Students acquire basic vocabulary and learn grammatical constructions necessary for essential communication. Coursework includes a variety of extensive online components.

LS 101 Prerequisite: None LS 102 Prerequisite: Successful completion of LS 101; demonstrated comparable competence; or permission of the department.

LS201, 202 Intermediate Spanish 1/2 - 2/2 .5 CU/quarter

Further develops listening, speaking, reading and writing skills, enabling students to successfully communicate in everyday situations (e.g. narrating present, past and future activities). Cultural topics are presented throughout the term. Coursework includes a variety of extensive online components.

Prerequisite: Successful completion of LS102; demonstrated comparable competence; or permission of the department.

LS203 Intermediate Conversational Spanish .5 CU/quarter

An intensive and fast-paced review of intermediate level Spanish, this course serves as a bridge for motivated students who wish to move into the advanced level courses.

Course includes extensive vocabulary building activities as well as reading, writing, and listening enrichment through authentic texts, situational practice and online technology.

Prerequisites: LS202; demonstrated comparable competence; or permission of the department.

LS301, 302 Advanced Conversational Spanish 1/2 - 2/2 .5 CU/quarter

A comprehensive, in-depth two-part sequence with a strong emphasis on communicating and building a highly functional command of all grammatical constructions and enhanced vocabulary through situational practice, formal and informal presentations and writing as well as online activities. Units include commentaries on political and social issues as well as cultural topics.

Prerequisite: LS203 Note: Motivated students completing LS 202 may qualify with approval of the department.

LS401, 402, 403 Fourth Year Spanish 1/3 - 2/3 - 3/3 .5 CU/quarter

This three-quarter sequence is intended for students who wish to develop proficiency and integrate their language skills, using authentic material and sources. Students who enroll should have feel comfortable with previously learned grammatical concepts and a basic understanding of the cultural aspects of the Spanish speaking world. This course is the equivalent of a fifth or sixth semester college level course. Students will develop proficiency across three communicative modes- interpersonal, interpretive and presentational. Coursework includes web components that reinforce these communicative approaches and the overarching themes of real world communication. Students who successfully complete this course may opt to take the AP Spanish Language Exam in May.

Prerequisite: Successful completion of LS302 or demonstrated comparable competence.

LS460, 461, 462 Advanced Spanish Reading and Writing .25 - .5 CU/quarter

The course allows students to develop their writing and presentational skills through reading and interpreting a variety of texts ranging from authentic online news journals, historical, cultural and literary readings as a means of developing critical thinking. Highly recommended for seniors who have completed the fourth year sequence in their junior year and who wish to strengthen previously acquired skills before graduating. This course may not be offered every term and is subject to joint agreement between teacher and student.

Prerequisite: Successful completion of LS 403 or demonstrated comparable competence.

LS400 Program Abroad Spain .25 - 1.5 CU/quarter

This cultural immersion program is designed for qualified students of Spanish. Participants visit Seville, Spain during the fall quarter, residing with a host family. They attend classes at the prestigious Colegio Europa, while enjoying the culture of Seville in the company of their hosts and Spanish classmates. Seville counterparts attend ASMS, while residing at ASMS. American host families enjoy time with their "host" child during school breaks and other planned activities that would enhance the student's cultural understanding of life in the US. Qualified and interested students should submit an application to the program's director at the beginning of the school year.

Prerequisite: Permission of the program's sponsor. Elective credit for up to 1.5 credits will be determined upon return by sponsor.

History

HS100 Introduction to Western Thought .5 CU

This course chronologically studies dominant strands of western thought from the twelfth to the seventeenth century. Assigned readings and class discussions should enable students to better understand the world-views and intellectual constructs shared by contemporaries across Europe from the Middle Ages to the beginning of the European Enlightenment in the late seventeenth century. This course examines the acquisition of knowledge, ways of knowing, and the knowledge areas of interest to educated Europeans during the Medieval and Renaissance periods with a particular focus on natural philosophy and scientific thought as it develops within the context of a Christian world. Students will learn about the strong relationship between science, magic, and religion in the centuries before the Scientific Revolution and there will be a concerted effort throughout the quarter to incorporate popular beliefs as any study of intellectual change must acknowledge that concepts and ideas are created and diffused through various modes of discourse and a complex web of social relationships. Multi-media project serves as final course assessment. Required for Sophomores.

HS101 Advanced American Studies 1 .5 CU

This course includes the political, socio-cultural, and economic factors in the development of America as a nation from European colonial settlements to the end of the Civil War. The course will focus on the changing aspirations and behavior of ordinary Americans as well as the transformative achievements of the powerful and famous. The objective is to understand not only what happened, but also why it happened. The course will allow students to analyze critically the significance of race, ethnicity, religion, class, and gender in the American Experience and prepare students to make their own judgments about the relative importance of different factors in shaping the American past. Prerequisites: none.

HS102 Advanced American Studies 2 .5 CU

This course includes the political, socio-cultural, and economic factors in the development of America as a nation from Reconstruction to the present day. The course will focus on the changing aspirations and behavior of ordinary Americans as well as the transformative achievements of the powerful and famous. The objective is to understand not only what happened, but also why it happened. The course will allow students to analyze the significance of race, ethnicity, religion, class, and gender in the American Experience and prepare students to make their own judgments about the relative importance of different factors in shaping the American experience. Prerequisites: HS101.

HS103 Western Thought II .5 CU

This course in Western thought explores the relationship between man and the natural world. From the philosophers of antiquity to today's historians of ecology, the physical environment has been for humankind many things: a retreat from the stresses of urban life, a landscape to paint, a habitat to modify and a precious resource to protect. It has inspired composers but has also been used to validate certain political ideologies. Through the centuries civilized man has widened the distance between himself and the

natural world but has never wanted to be disconnected from it entirely, for he as a human being is organically and spiritually connected to it. This class takes a chronological view at man's changing attitudes and behavior towards nature and the living creatures found within it. Class texts are primary sources which encompass everything from pre-Christian sacred groves and temples to personal journals, religious writings, medieval bestiaries, Renaissance gardens, paintings, scientific treatises and our own national parks. Lecture and discussion, group activities. Published digital scrapbook is final project. Prerequisites: HS100.

HS107 The American West .5 CU

This course covers the history of the American West, from European contact through the late 20th century, with focus on the 19th and 20th centuries. The course will explore the myths that impelled countless Americans from all walks of life to join in westward expansion. More importantly, we will study the variety of myths produced by the experience of westward expansion, including stories of pony express riders, social bandits, Indian fighters, schoolmarms, prostitutes, homesteaders, railroad barons, and so forth. We will contrast this mythology against the backdrop of the "reality" of Western history by looking at the lives of "neglected people" who settled the West (such as women and minorities), the genocidal destruction of Native American societies, and the role of big businesses and capitalism in Westward expansion. Prerequisites: HS101.

HS109 History of the Church .5 CU

Students study the early history of the Christian Church, including the development of church leadership, famous quarrels concerning the nature of Christ, the role of the Church Fathers, the canon of the Bible. Prerequisites: none.

HS110 History of Religion: Ancient Faith and Philosophy .5 CU

A course on the history of the beliefs about the afterlife in the ancient and medieval worlds: heaven, hell, purgatory, limbo. It explains different understandings and outlooks, from Egypt, the Jews, the Christians, the Persians, the Arabs. Prerequisites: none.

HS111 Biblical Literature .5 CU

This course examines the historical development and the texts of selected biblical themes and the Bible books themselves. Examples of the books selected are Judges and Daniel, in the Old Testament and Mark and Luke in the New Testament. Prerequisites: none.

HS114 Special Topics in World History: The Modern Middle East .5 CU

This course studies the emergence of the Middle East in the modern period, roughly from the late eighteenth century to the present. It begins with state-building as structured by European powers during the post WWI period and traces political change and ideological trends in the region with an eye to better understanding political relationships that have developed both within and external to the region. Topics covered will be nationalism and independence; the Arab-Israeli Conflict and the quest for peace in the Middle East, the Saudi-U.S. relationship, America's relationship with Israel, the Iranian Revolution and Islamic fundamentalism, as well as the politics of oil. Special attention will be given to how the Cold War, Afghanistan, the Persian Gulf War, the Iraq

War and the War on Terror have shaped today's Middle East, politically, economically, and socially. Prerequisites: AASI and II.

HS115 **Egyptology** **.5 CU**

Students study ancient Egypt's history and religion, including great monuments like the pyramids and the sphinx, as well as the whole phenomenon of mummies ("up close" in modern research on surviving mummies), rulers including Khufu, Tut and Cleopatra. Prerequisites: none.

HS116 **The Romantic Era in Europe and America** **.5 CU**

An interdisciplinary study of American and Anglo-European society and culture from 1770-1850, this course explores some of the great works of art, music and literature of the Western world in the context of the economic, social and political changes of the same period. The geographical focus is on France, Germany, England and America, which are bound together by ideas, values and leitmotifs characteristic of America and Western Europe in the nineteenth century: rebellion, individualism, celebration of the common man, nostalgia for the past, a desire to connect with the natural world, and a utopian search for an ideal life that seems forever lost to cities and factories.. How these motifs and interests emerge from western societies that are urbanizing, industrializing, developing consumer cultures and a sense of national identity makes this course one that illustrates the connection between art and life but also the strands of thought that connect American and Europe. Prerequisites: HS101.

HS119 **Early Middle Ages** **.5 CU**

Students study the "fall of Rome" (how it both did and did not happen), the rise of the authority of the Popes in the Church, the cult of martyrs and saints, the identity of Franks, Goths, and other "barbarians." Prerequisites: none.

HS120 **Roman Civilization** **.5 CU**

The course explores Roman history and civilization from the early background through selected areas of emphasis , for example, the "twelve Caesars," the whole "gladiator thing," the War with Hannibal (and his elephants), Vestal Virgins, chariots in the circus races, the incredible third century, etc. Prerequisites: none.

HS121 **History of Religion: Comparative Religions** **.5 CU**

As the title indicates, this is an introduction to the comparison of world religions, including Judaism, Christianity, Islam, Hinduism , Greek and Roman religions. Respect is shown to all. Prerequisites: none.

HS201 **Economics** **.5 CU**

This course reviews topics in both microeconomics and macroeconomics with emphasis on the pervasive debate between the free market and government intervention. Topics to be covered include Classical economic theory, Keynesian economic theory, demand and supply, fiscal policy, monetary policy, income inequality and international trade. This course will prepare students to study economics at a more comprehensive level in college. Prerequisites: senior standing.

HS202 Advanced American Government .5 CU

This course introduces the history, general principles, policies, and problems of national government in the United States. The course will also examine the fundamentals of American democracy, including the Constitution, the nature of federalism, and the institutions and processes of the executive, legislative, and judicial branches of government. The role of public opinion, the media, and the participation of interest groups, social movements, and political parties in the U.S. political system are also emphasized. Prerequisites: senior standing.

HS205 American Minority Relations .5 CU

This course is a cultural and historical study of selected minority groups in terms of their social, political, and economic relationship to contemporary American society. The course will explore the psychological and sociological framework of minority / dominant group interaction patterns, and discuss the origins and causes of prejudice and discrimination. Issues explored in this course include: racial profiling, affirmative action, African American slavery reparations, bilingual education, immigration laws, reverse discrimination, the significance and place of the "N" word and other racial and cultural epithets in our society, sexual harassment, and homophobia and misogyny in popular culture. Prerequisites: HS101.

HS206 APC(American Popular Culture): A Social History of Rock and Roll .5 CU

This course presents a study of the history of Rock and Roll in the context of the history of America during the mid to late twentieth century. The evolution of Rock and Roll and the many influences of that evolution will be examined against the backdrop of historical and social issues from post-World War II America to the end of the Cold War. Historical influences such as the Civil Rights movement, the Vietnam War, the countercultural movement, Watergate, and the Reagan era will be examined for their connection to Rock and Roll and popular culture. Prerequisites: junior or above standing or HS101.

HS207 APC (American Popular Culture): Heroes and History .5 CU

This team-taught course in American Popular Culture is a study of comic books as a medium of communicating American cultural beliefs, ideas and values. Comic books reflect the changing interests of the creative teams that produce them but they also reflect changes in American society, politics, and the way Americans perceive the world. Originating in the 20th century, comic book characters and storylines reveal the hopes and fears of American citizens as much as they convey a strong sense of national identity and national purpose. In this class, comic book superheroes become a window into the crime of the 1930s, the adversaries America faced in World War II, the fear of Communism, increasing doubts as to whether government can protect us and the ways in which America changed as a people and society after the events of 9/11. Prerequisites: none.

HS208 Post-1945 U.S. and the World .5 CU

This course entails study of pivotal events in the history of United States foreign policy since World War II. It particularly examines America's relationship with the larger world with an eye to better understanding today's political conflicts and issues. Selected areas of study will include the Cold War, the Vietnam War, Nixon and Detente, American

Foreign Policy during the Carter and Reagan Administrations and America's post Cold War relationships with the newly emerging power centers of China and the European Union. An excellent elective for those students who wish a better understanding of America's global role and national policy in the late 20th Century. Prerequisites: HS102.

HS211 Terrorism and Violence in the Modern Age .5 CU

This course takes an historical look at the troubling phenomena of genocide, terror, and violence around the world in the twentieth and twenty-first centuries. A number of case studies will be examined to better understand why and how terror has been deliberately employed by political leaders such as Joseph Stalin and Cambodia's Pol Pot to extremist groups like the Ku Klux Klan. Covered will be crimes of war, genocide, state terror, and hate crimes as well as the terrorism associated with extreme religious views both in the United States and abroad. Lecture, discussion and a final project. Prerequisites: HS102.

HS214 Women of the Renaissance .5 CU

Moving away from the traditional survey approach to the field, this course will focus on the Renaissance from a feminist perspective. Did women have a Renaissance? The reality is that most did not, and for the majority of women, the Renaissance was a time when women were both denied equal protection under the law, and held to standards of beauty and behavior overwhelmingly determined and shaped by men. Synonymous with social, economic, and political change, the Renaissance for most women served to reinforce female submissiveness and patriarchal control but surprisingly it is an age that produced the first women artists and a number of powerful female monarchs. In this class, women of the Renaissance will be studied and it is their lives that become our window into this perpetually fascinating period of European history. Seminar with assigned readings and class project. A history elective for those interested in women's studies and the culture of the Renaissance. Prerequisites: none.

HS 215 Studies in Empire: Britain and America .5 CU

This course explores the subject of empire and imperialism through the examples of Great Britain and America. The purpose of this course is to explore the social, economic and political dimensions of empire and to consider what have been termed imperial views and policies from the perspective of the colonial or imperial power and the colonized or subjugated people they were directed towards. Emphasis is placed on the nineteenth and early twentieth century which allows study of the British Empire at its height but material will cover the Empire through WWI and the so-called twilight years of decline before colonial empires were dismantled in the decades after WWII. The last weeks of the course will focus on America as an empire in order to compare the two nations as empires. Class discussions will revolve around assigned readings. Individual research project required. Prerequisites: HS102.

HS216 A Little Revolution Every Now And Then .5 CU

While peace and stability are always desirous, it is revolutions that largely have created the world as we know it today. The Scientific Revolution of the seventeenth century helped create the political climate that produced England's Glorious Revolution, while the American and French Revolutions of the eighteenth century inspired the many uprisings and nationalist movements of the nineteenth century. In the twentieth century, all of these, as well as the Bolshevik revolution in Russia, became the model for those nations and peoples seeking self-determination and an end to colonial rule. This course will take a closer look at the concept of revolution as a means of bringing social, economic, and political change. This is an elective for those students who desire to know how ideology translates into "realpolitik". Discussion/Lecture plus collaborative learning experiences via group projects. Prerequisites: HS102.

HS217 America in the 1950s .5 CU

This course examines the decade of the 1950s in America from a socio-historical perspective. We will analyze the dichotomy of the nostalgic view of the decade as a time of economic prosperity, solid family values, and political and cultural harmony, compared to a revisionist perspective that illuminates the decade's racial tensions, gender stratification, burgeoning countercultural movement, and the genesis of the sexual revolution. Prerequisites: HS102.

HS218 America in the 1960's .5CU

This course explores the political, social, and cultural history of 1960s America. The "Sixties" is something of a misnomer. The period was defined less by the borders of a single decade than by movements and issues that emerged in the 1940s and were only partially resolved by the time Richard Nixon resigned the presidency in 1974. There also is no consensus about the era's meaning or significance—the 1960s continue to be the subject of passionate debate and political controversy in the United States. It was, many have said, a time of revolution, but whose revolution and who won? The times they were 'a-changin', but why, how, and to what end? In exploring this turbulent decade, the course examines what did and what did not change in the 1960s. Topics include: the presidencies of John F. Kennedy, Lyndon B. Johnson, and Richard M. Nixon; the triumph and breakdown of postwar liberalism; the resurgence of conservatism; the many insurgent political and social movements of the decade, including the civil rights and Black Power movements, the New Left, environmentalism, the Chicano and Red Power movements, feminism, and the gay liberation movement; the counterculture; the sexual revolution; rock 'n' roll; and the Vietnam war. We will investigate these and other issues in a mix of printed, visual, audio, and multimedia sources such as speeches, correspondence, newspapers and magazines, photographs, television, movies, and music.

HS220 History of Religion: Saints East and West .5 CU

An introduction to the meaning of saints or "holy persons" in various backgrounds. Famous saints are selected for up-close study with their historical circumstances, their claims to holiness, etc. Francis of Assisi and Mother Teresa have been featured among

Christian saints, and Ali, Buddha, Gandhi, and Shankara have been some of the eastern figures. Prerequisites: none.

HS226 History of Religion: Introduction to Islam .5 CU

An introduction to Islam, the Muslim faith and culture. The course includes the biography of Mohammad and an introduction to the Qur'an, the Muslim holy book. It also includes the history of the split between the Sunni and Shia, and the initial Muslim expansion in the Middle East. Prerequisites: none.

HS227 America at War .5 CU

This course examines the political, economic, social, and intellectual factors which lead to our long list of colonial, revolutionary, civil, and international wars from 1675 to 2003. The course emphasizes why American/colonials entered the various conflicts, major engagements of the conflict, and the outcomes generated by the conflicts. Strategy, tactics, and technology are major areas of interest. Lectures and student-directed presentations will be supplemented by a research project; drawn from contemporary sources covering public opinion and the impacts that selected conflicts exerted on American society. Prerequisites: HS102 recommended but not required.

HS228 Crusades .5 CU

This course will examine the character and causes of "crusades", both from eastern, Muslim perspectives as well as western, Christian perspectives. It will focus upon the cultural differences of the opposing parties, the leadership, the decision, and the consequences of crusades in general. When it comes to "popular myths", crusades are one of the most badly misrepresented historical developments; this course should be of real assistance in clarifying the issues. Prerequisites: none.

HS229 The New South .5 CU

This course examines the modern South from the end of the Civil Rights movement (Early 1970s) to the present day. Particular emphasis will be placed on contemporary Southern politics, identity, and culture to determine how much has changed and how much has remained bound by tradition. Topics will include economic trends, demographic changes, and the rise of suburbanization, the emergence of the Republican Party's political dominance, southern neo-conservatism and values as well as re-segregation. This class will be conducted primarily as a seminar and features a number of experiential learning activities, the participation of guest speakers, and a field research project. Prerequisites: HS102.

HS230 Special Topics in World History: History of Modern China .5 CU

This course explores modern China—its government, society, economy and culture. China is emerging as the economic superpower of the twenty-first century and Americans need to understand the Chinese people and the society as a whole since virtually every sector of American life is influenced by our relationship with this country. This course is for the serious student of history, economics and cultural studies. This class is student-centered, conducted as a college-level seminar with students leading class discussions every week and expected to participate daily in discussion of assigned readings. Prerequisites: HS102.

HS233 Introduction to Sociology .5 CU

This will be an elective course that studies human society and social behavior. Positive human relationships are an essential part of a civilized society, and how we interact with each other is important so that we can find answers to questions and solve problems in our world. As has been said, "Sociology teaches us to look at life in a scientific, systematic way", and "the values, beliefs, lifestyles of those around us, as well as historic events help to mold us into unique individuals who have varied outlooks on social reality." Therefore, this course will deal with the social atmosphere that helps to make us who we are and how we behave. Introduction to Sociology will cover topics such as culture, violence, deviance, social control, socialization and personality, group behavior, social class, and social institutions. The key component of this course is to study ourselves and the society that influences our behavior.

HS234 America's First Ladies (Cross-Reference History/Women's Studies) .5 CU

This course introduces students to America's First Ladies from Martha Washington to Michelle Obama. An academic complement to the U.S. Presidents course, learn how the women of the White House were often the power behind the men. Learn which first ladies smoked and enjoyed a good party and which ones commandeered the men in their lives from husbands to chefs. A fun and interesting way to explore American society and the American woman from the perspective of 1600 Pennsylvania Avenue. Prerequisites: none.

HS278 The Civil War .5 CU

This course will examine one of the most pivotal and defining moments in American History: the American Civil War. Grim, brutal, and personal, the Civil War (also called the War Between the States) pitted countrymen against countrymen and claimed more American lives than any other war fought during any time in our nation's history. Students will study the time period stretching from the Compromise of 1850 to the Presidential election of 1876, as well as the various reasons for the war, the combat, the eventual outcome, and the Reconstruction Period.

HS279 World War I .5 CU/quarter

World War I fundamentally changed the world. It forever changed the way we look at warfare, the idea of empire, the significance of alliances, even the value of human life. This course expands on what is typically taught in a survey course to fully explore the politics that led to war on a global scale, acquire in-depth knowledge of the key battles on the Western Front and elsewhere around the globe, to better understand the experience of battle for those that fought in it, especially in the light of the trench warfare that so characterized WWI, to develop greater awareness of the war's imperial or colonial aspects and finally to consider the consequences of the Great War or its aftermath. Lecture, discussion, student research project. Prerequisites: none.

HS280 World War II in Global Context .5 CU

This class on World War II begins with origins of the global conflict and follows the war through both the European and Pacific theatres. It presents the war from an international perspective as much as possible, covering the history and politics of the

war in Germany, Japan, and Italy, as well as that of the United States. Major battles, policy decisions, and personalities of the key participants are covered as well as the impact of the war on the home-front. While Germany's Third Reich is studied, the course does not provide an in-depth study of the Holocaust. Prerequisites: HS102.

HS300, 301, 302 AP U.S. History .5 CU/quarter

The Advanced Placement program in United States History is designed to provide students with the analytical skills and factual knowledge necessary to deal critically with the problems and materials of United States history. The course prepares students for intermediate and advanced college courses by making demands upon them equivalent to those made by full-year introductory college survey courses. In this pursuit, the acquisition of factual knowledge is the beginning point of the process, not the end. Students will learn to interpret and evaluate the relative significance of primary and secondary source material, and to present their evidence and conclusions clearly and persuasively in an essay format. The course will focus on the changing aspirations and behavior of ordinary Americans as well as the transformative achievements of the powerful and famous. The objective is to understand not only what happened, but also why it happened. The course will allow students to analyze critically the significance of race, ethnicity, religion, class, and gender in the American Experience and prepare students to make their own judgments about the relative importance of different factors in shaping the American past. Prerequisites: HS101 and permission of instructor.

MA201 Differential Calculus .5 CU

This introduction to the theory, techniques, and applications of differential calculus includes functions, limits, derivatives, related rates, maximum/minimum problems, and curve sketching, derivatives related to exponential, logarithmic, trigonometric and inverse trigonometric functions. Prerequisites: 'B' or better in both MA103 and MA104 or permission of the department.

MA202 Integral Calculus .5 CU

This introduction to the theory, techniques, and applications of integral calculus includes indefinite and definite integrals, area, volume, work, fluid force, integrals related to exponential, logarithmic, trigonometric and inverse trigonometric functions, and integration techniques. Prerequisite: 'B' or better in MA201 or permission of the department. NOTE: Students who plan to take the AP Calculus AB exam should complete MA201 and MA202.

MA203 BC Calculus .5 CU

BC Calculus studies a variety of calculus topics including infinite sequences and series, and parametric and polar equations. Other topics might include conic sections, introduction to differential equations and hyperbolic functions. Prerequisite: 'B' or better in MA202 or permission of the department. NOTE: Students who plan to take the AP Calculus BC exam should complete the calculus sequence through MA203.

MA205 Introduction to Statistics .5 CU

This course focuses on the statistical methods and reasoning, which are used in the natural and social sciences. Topics include: organizing, classifying, and comparing data; probability distributions, sampling distributions, estimation and hypothesis testing. Prerequisite: MA104.

MA206 Discrete Mathematics .5 CU

This course studies the mathematical elements of computer science including propositional logic, predicate logic, sets, functions and relations, combinatorics, mathematical induction, recursion, algorithms, matrices, graphs, trees, and Boolean logic. Prerequisite: Precalculus MA104.

MA207 Visual Mathematics .5 CU

This hands-on course emphasizes visual problem solving and teaches students how to research and write about the intersection of mathematics and the visual arts. Topics vary by term and may include but are not limited to: fractal geometry, linear perspective, tiling and tessellations, symmetry groups, knot theory, modular origami, compass and straightedge constructions, and classification of surfaces. Prerequisite: MA104.

MA301 Multivariable Calculus I: Vector Functions and Partial Derivatives .5 CU

This is the first half of a university-level course in multivariable calculus. This course includes the theory and application of vector functions and partial derivatives. Topics include: Vectors and the geometry of space, Vector-valued functions, Continuity and

MA404 **Number Theory** **.5 CU**

This course is an introduction to classical number theory with a balance of theory and computation. Topics include mathematics induction, divisibility properties, and properties of prime numbers, the theory to congruencies, number theoretic functions, and continued fractions. Prerequisite: MA104.

MA405 **Numerical Mathematics** **.5 CU**

This course is an investigation of methods of numerical computation with an emphasis on application of numerical approximation techniques in the solution of problems frequently encountered in engineering and science. Topics will include error analysis, solutions of equations, interpolation, quadrature, and linear systems. Prerequisite: MA202.

MA407 **Counting & Probability I** **.5 CU**

Topics covered include: Basic counting and probability techniques, Inclusion-exclusion, 1-1 correspondences, Pigeonhole Principle, Constructive expectation, Fibonacci and Catalan numbers, Recursion, Conditional probability, Generating functions , Graph theory. Prerequisite: MA104.

MA408 **Counting & Probability II** **.5 CU**

In this class students will continue their exploration of more advanced counting and probability topics. This class is the follow-up to Counting and Probability I. Topics include inclusion-exclusion, 1-1 correspondences, the Pigeonhole Principle, constructive expectation, Fibonacci and Catalan numbers, recursion, conditional probability, generating functions, graph theory, and much more. The class is structured to inspire the students to explore and develop new ideas. Important counting and probability techniques and powerful problem solving approaches are taught throughout the class. Prerequisite: MA104.

MA410 **AP Calculus Review** **.5 CU**

This course will focus on preparation for the AP Calculus exam. Prerequisite: students who plan to take the AP Calculus AB exam should complete MA201 and MA202; students who plan to take the AP Calculus BC exam should complete the calculus sequence through MA203.

MA420 **AP Statistics Review** **.5CU/quarter**

This course follows the AP Statistics curriculum set by the College Board and is designed to prepare students for the AP Statistics exam. The purpose of the AP course in statistics is to introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students will learn how to use graphing calculators and read computer output in an effort to enhance the development of statistical understanding. During this course, the student will be exposed to four broad conceptual themes and will be expected to demonstrate proficiency in: Exploring data: describing patterns and departures from patterns; Sampling and experimentation: planning and conducting a study; Anticipating patterns: exploring random phenomena using probability and simulation; Statistical inference: estimating population parameters and testing hypotheses. Prerequisites: MA205 or Permission by the Math Department.

used. Prerequisites: Students should be familiar with the basics of swimming and swim goggles are needed.

PE113 Table Tennis .5 CU

The course is designed to teach the fundamental skills, strategies and rules of table tennis. Students are given the opportunity to develop a competitive spirit and experience the benefits of table tennis as a lifetime sport. Prerequisites: none.

PE114 Tennis .5 CU

The course is designed to teach the basic skills, concepts and rules of tennis. Emphasis is placed on developing a strong foundation and understanding of the mental and physical skills required in tennis. Prerequisites: none.

PE115 Volleyball .5 CU

The course is designed to teach basic volleyball skills, rules, and strategies. Emphasis is also placed on officiating and competitive tournament play. Prerequisites: none.

PE124 Walking Jogging .5 CU

This course is designed to aid the student in the understanding and development of cardiovascular fitness through walking and jogging. The student will learn the benefits of aerobic fitness while enhancing their overall health.

PE125 Weight Training .5 CU

This course is designed to teach basic weight training techniques to improve strength and fitness levels of students. Emphasis is placed on development of exercise routines, proper physical conditioning methods, an understanding of anatomy and the history of weight training. Prerequisites: none.

PE126 Gentle Yoga .5 CU

This course is designed to emphasize stretching and relaxing the mind and body. Students will learn how to relax and relieve stress.

PE129 Circuit Training .5 CU

This course is designed to improve the overall fitness of the student. The course will combine cardiovascular training and strength training for a full body challenge.

PE131 Interval Training .5 CU

This course is designed to explore and practice interval training. Interval training involves alternating short bursts of intense activity with what is called active recovery.

PE132 Cardio Fitness Boxing .5 CU

This course is designed to combine elements of cardio and boxing for a full body workout. Punch, kick and block your way through this fun and challenging class.

PE200 Varsity Basketball (Women's) .5 CU

Varsity Basketball offers students the opportunity to compete interscholastically. Emphasis is placed on advanced skills, strategy, discipline, sportsmanship, teamwork and fitness. Prerequisites: none.

PE201 Varsity Basketball (Men's) .5 CU

Varsity Basketball offers students the opportunity to compete interscholastically. Emphasis is placed on advanced skills, strategy, discipline, sportsmanship, teamwork and fitness. Prerequisites: none.

PE202 Varsity Cross Country (Men's) .5 CU

Varsity cross-country offers students an opportunity to compete interscholastically. Emphasis is placed on endurance training, running skills, strategy, discipline, sportsmanship and teamwork. Prerequisites: none.

PE203 Varsity Soccer (Men's) .5 CU

Varsity Soccer offers students the opportunity to compete interscholastically. Emphasis is placed on advanced skills, strategy, discipline, sportsmanship, teamwork and fitness. Prerequisites: none.

PE204 Varsity Soccer (Women's) .5 CU

Varsity Soccer offers students the opportunity to compete interscholastically. Emphasis is placed on advanced skills, strategy, discipline, sportsmanship, teamwork and fitness. Prerequisites: none.

PE205 Varsity Tennis (Men's) .5 CU

Varsity Tennis offers students the opportunity to compete interscholastically. Emphasis is placed on advanced skills, strategy, fitness, discipline and sportsmanship. Prerequisites: none.

PE206 Varsity Tennis (Women's) .5 CU

Varsity Tennis offers students the opportunity to compete interscholastically. Emphasis is placed on advanced skills, strategy, discipline, sportsmanship, group dynamics, task commitment and fitness. Prerequisites: none.

PE207 Varsity Volleyball (Women's) .5 CU

Varsity Volleyball offers students the opportunity to compete interscholastically. Emphasis is placed on advanced skills, strategy, discipline, sportsmanship, teamwork and fitness. Prerequisites: none.

PE212 Varsity Cross Country (Women's) .5 CU

Varsity cross-country offers students an opportunity to compete interscholastically. Emphasis is placed on endurance training, running skills, strategy, discipline, sportsmanship and teamwork. Prerequisites: none.

PE215 **Athletic Manager** **.5 CU**

The course is designed to teach the skills and responsibility of athletic management.
Prerequisites: none.

PE216 **Cycling** **.5 CU**

The class is designed to use aerobic and anaerobic work on stationary bicycles as a method of managing weight, reducing stress, and enhancing wellbeing. During certain periods of the workout there will be opportunities to read, watch videos, and participate in lifelong learning while exercising. Emphasis will be placed on topics such as nutrition, exercise prescription and interdisciplinary learning. Prerequisites: none.

Physics

PH090 Introduction to Physics .5 CU

This course examines basic concepts of energy and force in topics such as planetary motion, geology, nuclear technology, and meteorology. In the Lab, students conduct lab activities to reinforce material from the lecture material. NOTE: This does not satisfy the 1.5 CU of physics required at ASMS. Prerequisites: MA100 or MA101 or passing score on the Algebra placement exam.

PH101H, 102H, 103H Honors Physics 1/3 - 2/3 - 3/3 .5 CU/quarter

In this three-quarter trigonometry-based course, students are introduced to the concepts of mechanics (kinematics, force, momentum, and energy), thermodynamics (buoyancy, fluid motion, heat energy, engines), electromagnetism (electric fields, electric circuits, magnetic fields, and electromagnetic theory), and wave physics (oscillatory systems, sound waves, wave optics, and spectroscopy). This is taught at a level comparable to university courses. Prerequisite: PH090 and MA103. Corequisite with PH101H: MA104 or permission of instructor.

PH101AP, 102AP AP Physics 1 1/2 - 2/2 .5 CU/quarter

In this two-quarter trigonometry-based course, students are introduced to the concepts of mechanics (kinematics, force, momentum, and energy), thermodynamics (buoyancy, fluid motion, heat energy, and engines), wave physics (oscillatory systems and sound waves), and electricity (electric fields and electric circuits). This is taught at a level comparable to university and Advanced Placement courses. Prerequisite: PH090 and MA103. Corequisite: MA104 or permission of instructor.

PH103AP, 104AP AP Physics 2 1/2 - 2/2 .5 CU/quarter

In this two-quarter trigonometry-based course, students are introduced to the concepts of electromagnetism (electric fields, magnetic fields, and electromagnetic theory), wave physics (sound waves, wave optics, and spectroscopy), and atomic and nuclear physics. This is taught at a level comparable to university and Advanced Placement courses. Prerequisite: PH102AP.

PH105 Astronomy .5 CU

This introductory survey course in astronomy covers the motion of the sun, moon, planets, and stars in the sky, lunar and solar eclipses, the tides, and seasons. The historical development of astronomy and astronomical models from the time of the ancient Greeks through Newton is discussed. The properties of solar system bodies are covered, along with current theories of the formation and evolution of the solar system. Finally, the basic properties of the sun and other stars are covered, along with our current understanding of the formation, evolution, and death of stars. Prerequisites: none.

PH109 Lasers and Holography .5 CU

Students begin with the wave theory of light. The propagation of waves through homogeneous and inhomogeneous media, theory of holography and its practice, and application of lasers to surgery and other fields are explored. In the lab, practical work in

laser techniques and holography are performed by students. This class is not offered every year. Prerequisite: PH101H, PH101AP, or PH201AP, or permission of instructor.

PH201AP, 202AP, 203AP AP Physics C 1/3 - 2/3 - 3/3 .5 CU/quarter

In this three-quarter calculus-based course, students are introduced to the concepts of mechanics (kinematics, force, momentum, and energy), thermodynamics (buoyancy, fluid motion, heat energy, engines), electromagnetism (electric fields, electric circuits, magnetic fields, and electromagnetic theory), and wave physics (oscillatory systems, sound waves, wave optics, and spectroscopy). This is taught at a level comparable to university and Advanced Placement courses. Prerequisite: PH090 and MA201. Corequisite: MA202.

PH207 Introduction to 3D Printing .5 CU

This course covers the emerging technology of 3D printing in Medicine, Electronics, Manufacturing and Engineering. Students will explore 3D printing in each of these fields, doing papers on the current use of this technology. As a practical component, the students will learn how to use CAD software such as Autodesk, Google Sketchup and Makerware to design practical devices. They will then convert these designs to STL files and use 3D printing to create these devices. Scanning technologies will also be used to copy 3D shapes which can then be recreated as solid prints. Prerequisites: None.

PH208 Mechatronics 1 .5 CU

This course introduces students to concepts of analogue electronics, electrical motors and machine control. They will be introduced to programming in Processing of the Arduino micro-controller, which will be used for data gathering, motor control and sensors. Prerequisites: none.

PH209 Mechanical Engineering .5 CU

Static and dynamic mechanical structures will be analyzed. Thermodynamics and fluid flow theory applied to Steam Power plants, heat exchangers and fluid flow systems. Analytical programs such as EPAnet used to analyze water systems. Prerequisite: none.

PH210 Mechatronics 2 .5 CU

This course continues Mechatronics 1 with the study of digital electronics and the structure of digital systems. Students will be given projects where they will do meaningful embedded system design. Prerequisite: PH208.

PH220 Aerodynamics .5 CU

This course analyzes the forces involved in flight applying properties of fluid flow and gas properties. Drag, lift, turbulence will be studied with a mind of how these forces affect flight performance and characteristics. We will study the rocket, fixed wing aircraft and rotary wing aircraft during the term. Flight characteristics will be examined with actual flights and with the school's wind tunnel. Prerequisite: none.

PH225 **Flight Studies** **.5 CU**

This online/lecture course prepares students to pass the written FAA Pilot Knowledge Test required for private pilot certification. This course covers aerodynamics, aircraft performance, instruments, engines and systems, weight and balance, flight maneuvers, airports, airspace and ATC, navigation, aviation weather, Federal Air Regulations, aeromedical factors and aeronautical decision making. (Fee Required) Prerequisite: PH 090, MA 101, and MA 103.

PH230 **Nuclear Engineering** **.5 CU**

Nuclear interactions examined. Reactor characteristics and operations discussed in terms of macroscopic cross sections and the six factor formula. Reactor operation and power production described in terms of reactivity. Construction and physics of nuclear weapons discussed. Prerequisites: none.

PH305 **Astrophysics and Cosmology** **.5 CU**

This course is an introduction to the physical properties of exotic astrophysical objects, and current theories about the nature of the universe and its past and future evolution. Topics from quantum mechanics and the special and general theories of relativity are introduced as needed. Topics covered include the properties, formation, and evolution of white dwarfs, neutron stars, and black holes, and our current theoretical and observational understanding of the past evolution and eventual fate of the universe. This class is not offered every year. Prerequisite: PH101H, PH101AP, or PH201AP, MA201, or permission of instructor.

PH308 **Quantum and Relativity** **.5 CU**

Einstein's theory of relativity is explored. Students cover the quantum theory of light, particle-wave duality of nature, and quantum mechanics. In the lab historical experiments leading to quantum mechanics and relativity are performed. This class is not offered every year. Prerequisite: PH102AP, or PH202AP, or permission of instructor.

PH400 **Directed Research** **Variable Credit**

This course involves intensive investigation of scientific instrumentation taken under the auspices of a physics instructor who mentors the student's research. This work customarily involves a variable number of contact hours and will often eventuate in a research paper, detailing the results of the investigation that has been undertaken. Prerequisites: none.

Study Options and Special Programs

Directed Reading

The student undertakes a specified course of study comparable to a regular course under the direct supervision of a faculty member. Credit is elective and may vary, from .25 CU or more.

Directed Research

The student pursues a defined research project on campus under the guidance of a faculty member. Credit is elective and may vary, from .25 CU or more.

NOTE: Directed Reading and Directed Research may not be substituted for the five academic courses that every student is required to take each term, nor may it replace grade 9 or 10 missing units of credit.

Student Orientation

This seminar style course is a requirement for all ASMS incoming students. A variety of topics, such as study skills, goal setting, communication, and plagiarism, will be discussed over the quarter that will help the student transition into life at ASMS. Successful completion will earn 0.25 CU.

Special Projects

Special Projects is an opportunity to engage in academic, experimental and experiential projects on a variety of topics, under the sponsorship of individual faculty members. The list of topics changes each year and includes a balance of on- and off-campus offerings. The usual duration of a Special Project is five class days but may be longer. Each student must participate in a Special Project each year. Grading is on a pass/fail basis; successful completion will earn .25 CU.

Foreign Exchange Programs

The Alabama School of Mathematics and Science is actively engaged in a German and Spanish exchange program. Students have the opportunity to indicate their interest in such an experience by submitting an official form. Students generally score very well on the respective AP language exams after such an experience abroad. Students who comply with the full exchange rules will be able to earn up to 1.5 CU as general elective credit for the entire quarter spent abroad in our programs.