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Bergen County Academies



Course Catalog

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Biology

Core Courses

Anatomy and Physiology

10, 11 Grade, Full Year

This course is a core requirement for the AMST academy.

Anatomy and Physiology, the study of the structure and function of the human body, is necessary as a basic science prerequisite for students seeking careers in the medical field. This course, which will also include basic chemistry, biochemistry, and histology, is designed to give the students a selective overview of human anatomical structure and an analysis of human physiological principles by following a sequential study of the major body systems in an organized and structured curriculum. There will be extensive laboratory activities that accompany each unit under study. Units will include characteristics of life, levels of organization, chemistry, biochemistry, cells, integumentary system, skeletal system, muscular system, nervous system (including the eye and ear), endocrine system, lymphatic and immune system, cardiovascular system (including the blood), respiratory system, digestive system, urinary system, and the reproductive system and embryology. Emphasis will be placed on the application of knowledge and skills from previous science classes to the study of human anatomy and physiology.

AP Biology

12 Grade, Full Year

For AMST Juniors beginning with the Class of 2026.

This course is an elective open to students from all academies. It is recommended that students have a strong background in biology or the lab sciences before taking AP biology. Class formats include lecture/discussion, cooperative group work, simulations, and lab work. Students are expected to read 2-4 chapters of text a week. The focus of the course will be to cover the topics looking at unifying themes in biology (emergent properties, evolution and diversity, form and function, science as a process) and ethical implications for science and society. Subject areas that are covered include: chemistry of life, cellular anatomy and physiology, evolution, classification and diversity of life, genetics, plant anatomy and physiology, animal anatomy and physiology, ecology. Upon completion of the AP biology course students are well prepared to take the AP Biology Exam.

Biology

9 Grade, Full Year

This course is a core requirement for the AAST academy.

This course consists of a comprehensive and challenging curriculum that supplies a solid scientific foundation for the student to build on in future science classes. Social and ethical issues are explored, as the student develops critical thinking and problem-solving skills, while investigating how Biology relates to the student's life and community. Students will have many opportunities for hands-on exploration through weekly laboratory assignments, modeling activities, media and technology and assigned readings.

Biology

9 Grade, Full Year

This course is a core requirement for the ACAHA & AVPA academies.

This course investigates the composition, diversity, complexity, and interconnectedness of life on Earth. Fundamental concepts of cells, heredity, evolution, and ecology provide a framework through inquiry-based instruction and laboratory experience, direct instruction, and technology to explore the living world, the physical environment, and the interactions within and between them. Students develop an understanding of the study of life, chemistry, and biochemistry. They explore topics including cell biology, homeostasis, photosynthesis, and cellular respiration. Toward the end of the year, students explain concepts including cell replication, natural selection, and ecology.

Biology

9 Grade, Full Year

This course is a core requirement for the AMST academy.

This is a comprehensive course that covers the fundamental and current topics in the biological sciences. It begins with a discussion of the nature of science and the scientific method of solving problems thus allowing for the student to appreciate all aspects of biology, the study of life. The course goes beyond the textbook, dealing with the newest discoveries in the biotechnology realm. (An investigation of the most important biological topics in modern life and their everyday applications.) Students begin by developing an understanding of the study of life, chemistry, and biochemistry. With a strong foundation, students explore more advanced topics including cell biology, homeostasis, cellular respiration, and photosynthesis.

Biology

9 Grade, Full Year

This course is a core requirement for the ATCS & ABF academies.

General Biology is a comprehensive course that covers the fundamental and current topics in the biological sciences. It begins with a discussion of the nature of science and the scientific method of solving problems thus allowing for the student to appreciate all aspects of biology, the study of life. The course goes beyond the textbook, dealing with the newest discoveries in the biotechnology realm. (An investigation of the most important biological topics in modern life and their everyday applications.) Students begin by developing an understanding of the study of life, chemistry, and biochemistry. With a strong foundation, students explore more advanced topics including cell biology, homeostasis, cellular respiration, and photosynthesis.

Biology

11 Grade, Full Year

This course is a core requirement for the AEDT academy.

The AEDT Biology course at the Bergen County Academies consists of a comprehensive and challenging curriculum that supplies a solid scientific foundation for the student to build on in future science classes. Social and ethical issues are explored, as the student develops critical thinking and problem-solving skills, while investigating how Biology relates to the student's life and community. During this year long course students will have many opportunities for hands-on exploration through laboratory assignments, modeling activities, media and technology and assigned readings.

Experimental Biology

9 Grade, Full Year

This course is a core requirement for the AMST academy.

Experimental Biology introduces students to experimental design, basic lab skills, and data collection and analysis in the biological sciences. Topics include (project development and experimental design) (elements of using primary literature) (bioinformatics) (technical writing) (laboratory techniques) (data collection) (data analysis and presentation) (representing data in figures) (and conveying technical information). Students will spend one trimester with each biology research teacher, learning to become comfortable working with different mentors and in different environments.

Full Year Electives

AP Biology

12 Grade, Full Year

This course is an elective open to students from all academies. It is recommended that students have a strong background in biology or the lab sciences before taking AP biology. Class formats include lecture/discussion, cooperative group work, simulations, and lab work. Students are expected to read 2-4 chapters of text a week. The

focus of the course will be to cover the topics looking at unifying themes in biology (emergent properties, evolution and diversity, form and function, science as a process) and ethical implications for science and society. Subject areas that are covered include: chemistry of life, cellular anatomy and physiology, evolution, classification and diversity of life, genetics, plant anatomy and physiology, animal anatomy and physiology, ecology. Upon completion of the AP biology course students are well prepared to take the AP Biology Exam.

IB Environmental Systems & Societies SL

12 Grade, Full Year

The systems approach provides the core methodology of this course and is amplified by other sources, such as economic, historical, cultural, socio-political, and scientific, to provide a holistic perspective on environmental issues. The aims of the course are to promote understanding of environmental processes on a variety of scales, from local to global; provide a body of knowledge, methodologies and skills that can be used in the analysis of environmental issues at local and global levels, promote critical awareness of a diversity of cultural perspectives, recognize the extent to which technology plays a role in both causing and solving environmental problems, appreciate the value of local as well as international collaboration in resolving environmental problems, appreciate that environmental issues may be controversial, and may provoke a variety of responses, and appreciate that human society is both directly and indirectly linked to the environment at a number of levels and at a variety of scales.

Trimester Long Electives

Agricultural Research Methods

9, 10, 11 Grade, Trimester Long

This course is the second required course for students to enter the Agriscience Program. During this course, students will identify a topic for their research and prepare their lab notebook so that they may engage in experimental research in the next trimester. It is anticipated that students will enter their independent or group research project into the FFA Agriscience Fair and/or other competitive events or display opportunities for student research. Students will work to solve complex, real-world problems through a focused research project. This process will include conducting research, data analysis and communication, and the development of new products. Prerequisite Intro to Agriculture.

Applications of Biology in Human Medicine

9,10,11,12 Grade, Trimester Long

This seminar course is designed to survey the latest trends and discoveries in the biosciences and how they are shaping the future of modern medicine. Topics will include the discovery, understanding and application of Crispr/Cas 9 in gene editing, modern mRNA vaccine development, cancer immunology, DNA sequencing, personalized medicine and recombinant DNA technology. The course will develop your knowledge in the latest trends in science and give you practice in critically reading and understanding cutting edge scientific research. Students will actively participate and get involved in leading class discussions and presentation of selected scientific information to your colleagues.

~Agriscience Research

9, 10, 11, 12 Grade, Trimester Long

Students use scientific principles and emerging technologies to solve complex problems related to AFNR (agriculture, food, and natural resources). This research takes place in the Environmental Science Center and the greenhouse. Developing a quality agriscience project requires focusing on an AFNR process or principal, identifying research objectives, collecting and analyzing data, and communicating results. Projects may involve plants, food, biofuels, marine organisms, and sustainable practices. Membership in the BCA FFA is required for students to

participate in the NJ State FFA Agriscience Fair where they can showcase their research and compete for awards. The elective course Introduction to Agriscience is required to join this research program.

Bioethics

9, 10, 11, 12 Grade, Trimester Long

This course is not available to the AMST academy.

Bioethics is the application of ethics to the field of medicine. This course is multidisciplinary, blending law, philosophy, insights from the humanities and medicine to bear on the complex interaction of human life, science and technology. By addressing significant questions, such as the ends and purposes of the life sciences, healthcare, the meanings and implications of distributive justice, and issues in global healthcare, it also explores deeper issues such as the meaning of life and death, pain and suffering and rights and responsibilities.

Botany

9, 10, 11, 12 Grade, Trimester Long

This course is the study of plant anatomy and morphology. As one of the electives in the agriscience program, this course introduces students to the growth, maintenance, and life cycles of all members of the Plant Kingdom. Special emphasis on flowering plants and their use as food, fuel, and fiber. As a laboratory based course, students will utilize their previous knowledge of biology with respect to cell anatomy and morphology and basic biochemistry to appreciate the life cycles, uses, and environmental impact that plants have on world ecology. Botany is a one trimester elective course and is open to all students in all grade levels.

~Cell Biology Research

9, 10, 11, 12 Grade, Trimester Long

The Biology Department offers interested students the opportunity to conduct independent research in the fields of cell and molecular biology. Independent research is a practical application of the scientific method, where students will be asked to develop a research project based on their own interests and the current primary literature. From there, students will design and conduct experiments, collect, and analyze data, and present their findings at a variety of fairs and competitions or potentially publish to a professional journal. Research is scheduled twice per week on an individual basis based on alignment of mentor and student schedules, but students should expect to spend additional time in the laboratory. AMST students are eligible for independent research after completing at least one trimester of Experimental Biology; all other students must take the Research in Cell Biology elective. Prerequisite AMST: 1 trimester of Experimental Biology; all other Academies: Research in Cell Biology elective .

Developmental Biology I

9, 10, 11, 12 Grade, Trimester Long

Developmental biology is the study of all aspects of growth and differentiation, from the genes and molecular events that control this process to the structural changes that an organism undergoes as it develops. This course is designed to be an introduction to the concepts and discoveries that pushed developmental biology to the forefront of modern medical research. Various modes of development will be discussed from embryonic development of animals to regeneration of limbs in salamanders. Embryonic and adult stem cells will be introduced and discussed in detail, with respect to the great potential power they have for regenerative medicine and discovery. The course will also address ethical issues that arise during the research and potential uses of stem cells.

Global Climate Change

10, 11, 12 Grade, Trimester Long

Explore the physical principles involved in planetary scale energy budgets and how changes to these budgets affect chemical and biological processes on Earth. Students will develop a solid understanding of the mechanics of climate change, and will investigate options for the mitigation of climate change and how society can adapt to changes that do occur. Note: Knowledge of Biology and Chemistry is helpful in understanding the course material.

Intro Agriscience

9, 10, 11 Grade, Trimester Long

This elective is the gateway course for the Agriscience Research program. In this elective, students are introduced to the science of modern agriculture; the industry that provides all the food, fuel, and fiber for the world population. Research and development into agricultural products and practices requires the application of botany, zoology, chemistry, molecular biology, and earth science combined with engineering practices. This course will provide the fundamentals required for a student to develop the plans for a successful research project in agriscience. Note: This is one of the prerequisites for Agriscience research.

Introduction to Cancer Biology

10, 11, 12 Grade, Trimester Long

Cancer is a highly complex, heterogeneous disease that is a global health issue that creates a significant burden of disease, especially in low and middle-income countries. Cancers are the second leading cause of death worldwide and in 2020 approximately 10 million cancer-related deaths occurred. This course will introduce students to the multifaceted field of cancer biology and is designed for students who would like to increase their understanding of the molecular basis for cancer initiation and progression. This course aims to educate students on the principles of cancer biology, the cellular and molecular mechanisms that regulate cancer, and the common detection and treatment strategies for patients. Students will have the opportunity to learn about these principles through the utilization of case studies, interactive media, and classroom discussions.

Introduction to Forensics

9, 10, 11, 12 Grade, Trimester Long

Explore the physical principles involved in planetary scale energy budgets and how changes to these budgets affect chemical and biological processes on Earth. Students will develop a solid understanding of the mechanics of climate change, and will investigate options for the mitigation of climate change and how society can adapt to changes that do occur.

Introduction to Surgical Techniques

11 Grade, Trimester Long

A completed application for this elective is required; 24 students (eight students per trimester) from the applicant pool are chosen to participate in this elective. Introduction to Surgical Techniques is an elective that offers Juniors the unique opportunity to gain research experience beyond the classroom in a surgical setting at Englewood Hospital and Medical Center (EHMC). Students who choose this elective should have a passion for STEM, a willingness to learn, and a desire to develop skills that can be used in the pursuit of their careers. This elective provides students with the opportunity to learn the fundamentals of surgical techniques utilizing an in vivo animal model, specifically rodents. Students will perform survival surgery on rodents thereby gaining experience in surgical preparation, aseptic technique, micro-suturing, bioethics, tissue collection, and post-operative care.

Introduction to Microscopy

9, 10, 11, 12 Grade, Trimester Long

Microscopy is a growing field of study that uses the microscope as an analytical tool with applications in medicine, cell biology, biomaterials, nanotechnology, engineering and many other disciplines. This elective will survey light and electron microscopy techniques, illustrating how to use imaging tools to answer scientific questions. Intro to Microscopy gives you the unique opportunity to have hands-on access to the laser scanning confocal and electron microscopes. Make the invisible world become visible in this lab-based course. NOTE: This is no longer a pre-research elective.

~Research in Cell Biology

9, 10, 11, 12 Grade, Trimester Long

This course is not available to the AMST academy.

Research in Cell Biology is the prerequisite elective required for independent research in cell/molecular biology. In this course, students will be introduced to primary scientific literature and how to use it to develop a research project proposal. The basics of working with cultured cells and molecular analysis techniques will also be covered. Upon completion of this course, students will be eligible to enroll in research, as an elective, with their mentor of choice. Note: Does not count as a science, biology, or medical elective.

Sports Medicine

9, 10, 11, 12 Grade, Trimester Long

Do you know what an ACL, MCL, and LCL sprain is? If you're a sports fan and wondering why your favorite athlete is out 30 days, this course will help you understand the anatomy and physiology of the injury and the common treatments. Students will learn about the most common sports injuries along with the common treatments of those injuries. Students will make a video of a real-life sports injury, with the appropriate prognosis, treatment, and timetable for return.

Topics in Oncology

10, 11, 12 Grade, Trimester Long

The 20+ year Expert Series elective provides a valuable experience if you are considering health care as a career or would like to know more about pediatric oncology and hematology. Students prepare for class by doing assigned readings, viewing PowerPoints, and preparing questions for the guest speakers. Current oncology topics are discussed, and students are supported with basic information in anatomy and physiology. Evaluation is via student journals written after speaker seminars.

Business

Core Courses

Business Finance Applications

10 Grade, Full Year

This course is a core requirement of the ABF academy.

Business Finance & Applications is an introductory course exploring important business financial concepts and applications and systems used to analyze them. Course content includes an in-depth understanding of financial accounting concepts and financial statement preparation and analysis, an understanding of US and international financial markets (interest rates, bond, and stock markets), the structure and functioning of US and international financial institutions and corporate financial management topics. The course will also explore areas of business applications: management decision-making tools and the application of the financial knowledge you have acquired in this and previous ABF courses. At the end of the year, students will have the opportunity to work in teams to create a comprehensive business plan.

IB Business Management SL

11, 12 Grade, Full Year

This is a two year course program.

This course is a core requirement of the ACAHA academy.

11th Grade/Year 1: ACAHA Business Management is taught as a two-year course using the IB course outline. The first year of this course will focus on the business functions, management processes and decision-making in contemporary contexts of strategic uncertainty. It examines how business decisions are influenced by factors internal and external to an organization, and how these decisions impact upon its stakeholders, both internally and externally. Business management also explores how individuals and groups interact within an organization, how

they may be successfully managed and how they can ethically optimize the use of resources in a world with increasing scarcity and concern for sustainability.

12th Grade/Year 2: ACAHA Business Management is the second year of a two-year sequence designed to follow the IB Business Management curriculum. The purpose of this course is to develop an understanding of business theory and principles and to apply these theories and principles to a variety of practical business situations. The course covers Marketing and Operations Management.

IB Economics HL

11, 12 Grade, Full Year

This is a two year course program.

This course is a core requirement of the ABF academy.

11th Grade/Year 1: In this course students will begin by developing an understanding of economics as a social science and then move on to introductory concepts such as scarcity, choice, Production Possibilities Frontier, and rationing systems. Most of the time in this course will be spent on microeconomic theory: markets, supply, demand, equilibrium price and quantity, price controls, elasticities, theory of the firm and market failure. Students will apply economic theory to current events and demonstrate their ability to evaluate current events using economic models. The entire course revolves around 9 fundamental concepts, Scarcity, Choice, Efficiency, Equity, Economic well-being, Sustainability, Change, Interdependence, and Intervention.

12th Grade/Year 2: IB Economics Higher Level is a two-year course required for students in the Academy for Business and Finance beginning in the junior year. The course covers four main content areas: Introduction to Economics, Microeconomics, Macroeconomics and Global Economy. In the first year of this course, we cover some introductory economic concepts and in the senior year the focus is on Macroeconomics and the Global economy. There is a significant focus on applying the curriculum topics we cover to relevant world events. We will also practice IB assessments to prepare for the assessments that you will take at the end of the senior year. Students apply economic theory to current events and demonstrate their ability to evaluate current events using economic models. The entire course revolves around 9 fundamental concepts, Scarcity, Choice, Efficiency, Equity, Economic well-being, Sustainability, Change, Interdependence, and Intervention.

~Financial Literacy Online

12 Grade, Full Year

This course is a core requirement for the AAST, AEDT, AMST, ATCS, AVPA academies.

Financial Literacy is an asynchronous, self-paced, online class that teaches real-world finance and practical life experience. Students practice managing their money and test their decision-making skills while put in a position to tackle realistic financial dilemmas as they strive to earn money for college registration. The game guides students through financial basics as well as complicated topics like credit cards, auto loans, and insurance. Students are presented with challenging, real-life financial problems such as building and maintaining healthy credit, qualifying for a mortgage, utilizing insurance, and more—all while managing a budget and working toward a savings goal.

Management Marketing

9 Grade, Full Year

This course is a core requirement of the ABF academy.

The Management and Marketing course explores the nature and scope of business and examines its component parts. The course will discuss the different forms of business ownership, including sole proprietorships, partnerships, and corporations to describe how business is organized and managed. The course will provide an integrated and balanced coverage of the internal and external forces that comprise our business and economic system and the legal environment. Students will learn the importance of ethical decision-making and the effects that decisions have on organizations, consumers, and employees. The course also focuses on the study of the methods and institutions involved in the movement of goods and services from producers to customers. Marketing will enable students to understand the process, development, opportunities, and strategies in developing a marketing mix.

Full Year Electives

AP Macroeconomics

12 Grade, Full Year

This course is where students learn about the dynamics of the economy, topics like business cycles, unemployment, inflation, and growth are discussed. The students will learn about the basic measures of economic activity, aggregate demand, and supply. The course outlines the working of the Federal Reserve System and the tools of monetary and fiscal policy. The final section of the course deals with international economics, where the students learn about the effect of world trade, capital flows and determination of foreign exchange rates. The course is divided into seven major sections and each section is taught so that students can analyze the real economy and make their own economic decisions. The class is designed around but not limited by the AP curriculum. All students must take the AP exam in May. Note: Prerequisite: AP Microeconomics

AP Microeconomics (AAST, ACAHA, AEDT, AMST, ATCS, AVPA)

11, 12 Grade, Full Year

This course is a core requirement for the AAST, ACAHA, AEDT, AMST, ATCS, AVPA academies.

This course is the study of individual players in the circular flow of the economy. It is the part of economics concerned with: (1) decision making by individual units such as a household, a firm, or an industry as well as (2) individual markets, specific goods and services, and product and resource prices. Throughout this course, students will study how consumers, firms and the government make economic decisions and the resulting effects these decisions have on the remaining sectors. Students will know and understand economic models in each unit to the extent that you can apply those models to various economic situations and changes. Note: All students must take the AP exam in May.

Trimester Long Electives

~Business of Sports-

9, 10, 11, 12 Grade, Trimester Long

Did you know that the sports business is a \$73 billion dollar industry? If you're a sports fan and interested in the business side of sports, this course will help you understand the many facets of sports business. Students will learn about the revenues and expenses of running a professional sports franchise. Students will explore the business of fantasy sports, agents, business managers, branding, endorsements, and wagering. Students will make a video of a business proposal for a new sports business.

~Federal Reserve Challenge I

11, 12 Grade, Trimester Long

This elective is only available to the ABF academy.

This course is an elective open to ABF juniors and seniors selected through a competitive tryout process. It is designed to prepare students to compete at the Federal Reserve Bank of New York's Fed Challenge. This competition is designed to bring real-world economics into the classroom. The team will research economic issues related to the theme selected by the Federal Reserve and write a research paper exploring a specific research question. Note: There is a tryout process to be selected for the team.

Introduction to Entrepreneurship

9, 10, 11, 12 Grade, Trimester Long

This elective is not available to the ABF & ACAHAS academies.

Course explores the entrepreneurial process and the knowledge, tools and skills that are required to be successful entrepreneurs. Students will focus on identifying and evaluating opportunities for new business opportunities. The key concepts include industry factors, market and competitive factors, and customer needs. Students will work on the development of a new business idea.

Marketing

9, 10, 11, 12 Grade, Trimester Long

This elective is not available to the ABF & ACAHA academy.

The Marketing course is an introduction to the study of the methods and institutions involved in the movement of goods and services from producers to customers. Marketing will enable students to understand the process, development, opportunities, and strategies in developing a marketing mix. Emphasis will be placed on consumerism, social and legal aspects of the process, market understanding and decision-making. We will examine pricing, distribution, promotion, and product policies.

Markets and Trading

9, 10, 11, 12 Grade, Trimester Long

The course serves as an introduction to the financial markets and the securities traded in these markets. Course format will include lectures, classroom discussion and hands-on use of Bloomberg and other trading software to teach introductory stock and options markets concepts. Course content will include detailed discussion of current economic developments and stock and equity options markets as well as extensive participation in real-time trading cases and related analytic tools. Students will be expected to keep a Trading Journal designed to summarize the results of their investment decisions and a Daily Journal of key economic data, political and economic current events and developments in the financial markets. A final portfolio project will be submitted by students demonstrating and understanding of the class concepts and learning objectives.

Chemistry

Core Courses

AP Chemistry

11, 12 Grade, Full Year

This course is a core requirement for the AAST academy.

AP Chemistry is a lab science course aimed to increase students' readiness to study related chemical concepts within a variety of college majors including the physical sciences, biological sciences, material science, and chemical engineering. To that end, the curriculum balances breadth of content coverage with depth of understanding. The major topics covered in AP Chemistry are: Equilibrium, Acid/Base Equilibrium, Atomic Structure, Structure and Bonding, Kinetics, Thermodynamics, and Electrochemistry. Through laboratory investigations, students learn proper laboratory techniques and practice proper safety procedures, in addition to developing advanced inquiry and reasoning skills such as designing a plan for collecting and analyzing data, applying mathematics, and connecting concepts across domains. The most recent additions to the BCA AP Chemistry curriculum include the theory and practice of spectroscopy and separation technologies, and a dedicated unit on Organic Chemistry, all of which are content areas that go beyond the scope of a typical high school AP Chemistry course. Prerequisite: 10th grade Chemistry.

Chemistry

9 Grade, Full Year

This course is a core requirement for the AAST academy.

The basic themes of the course are atomic structure, chemical nomenclature, chemical bonding, stoichiometry and chemical reactions, solution chemistry, introductory acid-base chemistry, and gas behavior. This course is intended to prepare AAST students to be successful in the sophomore chemistry course and give students a thorough understanding of the structure of atoms, molecules, and compounds. In addition, students will be well-versed in chemical reaction stoichiometry, acid-base chemistry, and gas laws. This course includes a lab rotation which meets every third Wednesday in which students learn safe lab practices, the key components of record keeping, and practice techniques and applications learned during the course.

Chemistry

10 Grade, Full Year

This course is a core requirement for the AMST academy.

The basic themes of the course are chemical nomenclature, stoichiometry, type of chemical reactions, thermochemistry, gasses, atomic structure, chemical bonding and molecular geometry, liquid, solid and solutions, chemical equilibrium, and acids and bases. The course is intended to give medical students a thorough understanding of chemical compounds and how they react, the three-dimensional structure of matter, and the application of these understandings to the idea of equilibria in physical systems. Demonstrations are used wherever possible and cooperative learning exercises are used extensively in the more advanced topics of the course. The course includes a laboratory component which allows for developing practical lab skills.

Chemistry I

9 Grade, Semester Long

This course is a core requirement for the AEDT academy.

The basic themes of this course are atomic structure and understanding and quantifying chemical reactions. This course is intended to give students a thorough understanding of the structure of atoms, molecules, and compounds. Using this knowledge, they will be able to understand their properties including reactivity. In addition, students will be able to quantify reactants used and products formed during chemical reactions. This course comes with an additional laboratory rotation where students learn safe lab practices, learn the key components of record keeping, and practice techniques and applications learned during the course.

Chemistry

10 Grade, Full Year

Basic themes of the course are atomic structure, the behavior of gasses, thermodynamics, acids and bases, and chemical equilibrium. The course is intended to give students a thorough understanding of chemical compounds and how they react, the three-dimensional structure of matter, and the application of these understandings to the idea of equilibria in physical systems. Demonstrations are used wherever possible and cooperative learning exercises are used extensively in the more advanced topics of the course. The course includes a laboratory component which allows for the application of key concepts. Students keep a laboratory notebook, and learn the key components of record keeping, and how to produce a good laboratory report.

Chemistry II

10 Grade, Semester Long

This course is a core requirement for the AEDT academy.

The basic themes of this course are understanding chemical reactions with real life applications, behavior of gasses, thermodynamics, chemical equilibria, and acid/base chemistry. This course is intended to give students a thorough understanding of oxidation/reduction reactions, behavior of gasses, heat exchange during chemical and physical processes, and understanding and quantifying equilibria. This course comes with an additional laboratory rotation where students learn safe lab practices, learn the key components of record keeping, and practice techniques and applications learned during the course.

Chemical Systems & Engineering

10 Grade, Full Year

This course is a core requirement for the AAST academy.

The course is designed to introduce students to chemical concepts with connections to chemical engineering. The major topics covered include Thermodynamics, Atomic Structure, Bonding, Solutions and States of Matter, Kinetics, Equilibrium, Acid-Base Equilibrium, and Electrochemistry. To accomplish the class goals, the students must first be introduced to new topics, often making use of demonstrations. They can then participate in questioning and discussion, problem solving, laboratory experiments, and collaborative projects. During lab investigations, students learn proper lab techniques and practice proper safety procedures. Connections between chemistry and engineering will be accomplished through lab experiments which may include: block flow diagrams, desalination and engineering design processes, chemical reaction optimization and scale up techniques, and testing physical properties of substances. Prerequisite: 9th grade AAST Chemistry course.

Full Year Electives

AP Chemistry

11,12 Grade, Full Year

This full year elective is a systematic review of previous chemistry courses with the addition of some new material. Topics covered include gas laws and stoichiometry, equilibrium, acid base chemistry, atomic theory, structure and bonding, thermodynamics, chemical reactions states of matter, colligative properties, kinetics, electrochemistry, and organic chemistry. Labs are also an important part of the course. AP Chemistry focuses on developing analytical and problem-solving skills. Assessments include weekly quizzes along with three- or four-unit tests in a typical trimester. Prerequisite: Department approval required for other academy students.

Advanced Topics in Chemistry

12 Grade, Full Year

Advanced Topics in Chemistry (& More) will expand on concepts found in traditional high school chemistry courses while introducing students to foundational and “leading edge” topics not found in AP science classes. While many of these topics are traditionally associated with chemistry, connections to biology, physics, and other STEM areas will be an essential part of the course. By studying the broad themes of Materials of Modern Living, The Future of Energy, and 21st Century STEM Trends, students will explore the richness of the entire periodic table of the elements, closely study the reactions and materials that make modern living possible, examine energy challenges and potential solutions, and stay informed of current events in all avenues of science. In addition to this content, the course will include frequent demonstrations by the teacher and hands-on activities for the student. Guest speakers, including BCA alumni, and field trips to our collaborators in industry and academia are planned. Prerequisites: AP Chemistry, AP Biology, AP Physics or instructor approval.

Trimester Long Electives

Advanced Topics in Chemistry

9, 10, 11,12 Grade, Trimester Long

During this trimester elective, students will explore historically significant advances in chemistry not covered in previous science classes while gaining important context to science students already know. Particular attention will be given to important advances within chemistry and related fields from the past decade with a focus on topics likely to be active areas of research as BCA students enter these fields during college and beyond. Interested students should be comfortable with discussing chemistry concepts at an Advanced Placement (AP) level. While not a requirement, it is recommended that students also complete at one trimester of chemistry electives other

than AP Chemistry prior to enrolling in Advanced Topics in Chemistry. Prerequisite: open to students who have finished at least two (2) trimesters of AP Chemistry.

~Chemistry Research

10, 11, 12 Grade, Trimester Long

Chemistry research is a project-based elective course for independent student research in the emerging field of chemistry and nanotechnology. Students will perform their own experiments under the supervision of their mentors and collect their own data utilizing various state-of-the-art scientific equipment. Students will nurture critical thinking abilities by analyzing research data and polish communication skills to present their outcome to their peers by participating in various forms of science competitions. Students will be assessed based on student's participation and progress on their research project.

Forensic Science

9, 10, 11, 12 Grade, Trimester Long

You will learn the basic principles of Forensic Science while learning how to identify, examine, and collect key types of evidence such as fingerprints, hair and fiber samples, and blood spatter. This is a laboratory based elective. Therefore, you will be dusting and developing fingerprints, comparing hair and fiber samples, and examining blood spatter to see firsthand the information that can be learned by the evidence. The elective will culminate with the project "Crime Scene in a Box" where you have the opportunity to set up a crime scene incorporating evidence while solving another group's crime scene.

Foundations of Nano

9, 10, 11, 12 Grade, Trimester Long

This course serves as a prerequisite for chemistry/nanotechnology independent research. For any students who are interested in learning and understanding nanoscience and nanotechnology. Students will explore the fundamental theories and experimental practices of this multidisciplinary science with a focus on the chemical, biological and electronic applications of nanotechnology. Students will learn and apply the theories of nanotechnology through a combination of class discussions and hands-on experimentation. Assessment will be based on invention challenge project presentation, lab worksheet, and take-home test.

Medicinal Chemistry

10, 11, 12 Grade, Trimester Long

This course will provide an introductory overview to the field of medicinal chemistry and will explore how the structure of bioactive medicinal compounds impacts how they behave in the body. Learn how to design a drug to bind to a specific receptor, how to formulate a drug for immediate or gradual release, how to treat a drug overdose and other exciting and interesting topics in med chem. This course includes two take-home assignments that can be worked on collaboratively and in-class problem sets corresponding to the topics covered in class. Prerequisite: Must have already completed 1 chemistry class.

Organic Chemistry I

10, 11, 12 Grade, Trimester Long

Are you planning on a career in chemistry, chemical engineering, material science, medicine, pharmacy, biochemistry, or biotechnology? Organic chemistry is essential to all these fields. Organic chemistry is often considered to be one of the most difficult undergraduate classes – requiring a great deal of memorization. If you have ever taken a class with me, you know how much I hate that word! The memorization approach is the cause of organic chemistry's reputation and a recipe for failure. This class will focus on learning and understanding the basic principles of organic molecule structures and organic reaction mechanisms. Prerequisite: completion of at least two (2) trimesters of a sophomore core chemistry class or enrollment with instructor approval.

Organic Chemistry II

11, 12 Grade, Trimester Long

Organic Chemistry II continues the discussions regarding the structure and reactivity of most of the commonly encountered classes of organic molecules started in Organic Chemistry I. The course is discussion based and does not include a lab component. Students should come to each class prepared to take a significant number of notes. Topics include stereochemistry, substitution reactions, elimination reactions, chemistry of alkenes, alkynes, aldehydes, and ketones. Assessments will include 2 to 3 collaborative problem sets and one final exam.

Prerequisite: completed Organic Chemistry I.

~Strategies in Chemistry

9, 10, 11, Grade, Trimester Long

Strategies in Chemistry elective provides students with additional support for their core chemistry class. It will be of most interest to students taking a freshman or sophomore core chemistry class wishing to get extra help on problem solving skills as well as essential chemistry concepts. This course provides students additional support in their core chemistry class. This elective will be of most interest to students taking a freshman or sophomore core chemistry class wishing to get extra help on problem solving strategies and the essential chemistry concepts involved in these first- or second-year courses.

Computer Science

Core Courses

Advanced Topics in Computer Science Sequence

11 Grade, Full Year

These courses are a core requirement for the ATCS academy.

Math Foundations of Computer Science (1 trimester)

In this course, we will dive into the mathematical side of computer science. First, we explore Boolean Algebra, and demonstrate how we can utilize this knowledge to create electronic computation. We then learn how to use inductive techniques to prove the correctness of computer algorithms. Finally, we explore set theory, with an eye towards the cardinality of infinite sets and Russell's Paradox.

Functional Programming (1 trimester)

In this course we will explore the functional paradigm of programming, entertaining the idea of immutability in computation, and do a deep dive into recursion. We will then turn our attention to lambdas, first in programming, and then in Alfonso Church's lambda calculus, an algebra which allows us to compute anything computable using only three types and three operations.

Computational Theory (1 trimester)

This course provides a basis in computational theory, which is the mathematical field that addresses the question, "what is fundamentally computable, and what is fundamentally incomputable?" We will examine the main three mathematical models of computation: finite state machines, pushdown automata, and Turing machines. We will also spend time on the Church-Turing thesis, examining how Alfonso Church's untyped lambda calculus and Alan Turing's Turing machines can encompass the same power of computation. At the culmination of this course, students build a full interpreter for a Turing-Complete language, Lambda Calculus.

AP Computer Science A Data Structure

10 Grade, Full Year

This course is a core requirement for the ATCS academy.

The curriculum is based on the syllabus developed by the College Board, plus additional topics on data structures. Topics include program design and implementation, algorithm analysis, and object-oriented programming design. Additional data structure topics include: queues, stacks, linked lists, heaps, and binary trees. AP Computer Science in Java emphasizes programming methodology with an emphasis on problem solving and algorithm development.

Students learn about program design principles that allow them to write programs that are understandable, adaptable and reusable. Students are introduced to other important computer science concepts including the development and analysis of algorithms, interface vs implementation, and abstraction. Assessments and student work focuses on correctly solving real world problems and applying programming skills in a variety of ways.

Capstone Computer Science

12 Grade, Full Year

This course is a core requirement for the ATCS academy.

The goal of this course is to give you the real-world experience of developing a large project for a client with a small team. You will be introduced to Agile-style project management, and learn new technologies and techniques as needed. The various assignments throughout this course are designed to keep you on track and accountable for the duration of your project.

Introduction to Computer Science

9 Grade, Full Year

This course is a core requirement for the ATCS academy.

Intro to Computer Science introduces students to computer science and programming. The course begins with a study of the Python language, including basic input and output, conditions, loops, modularization via functions, classes, objects, and graphics programming. The course then continues with an introduction to web programming with HTML, CSS, and JavaScript; students learn the basic language structure, control flow, event-based programming, and class and object design. Two open-ended group projects are built, once between course topics, and once at the end, to promote team-based development skills.

Full Year Electives

AP Computer Science A

11,12 Grade, Full Year

Understand core aspects of computer science which you can use to create solutions that are understandable, adaptable, and when appropriate, reusable. The design and implementation of computer programs to solve problems involve skills that are fundamental to the study of computer science. This includes the development and analysis of algorithms and fundamental data structures, and the use of logic and formal methods.

Prerequisite – Foundations of Computer Science (1, 2, and 3) OR Instructor Approval.

Foundations of Computer Science

9, 10, 11, 12 Grade, Full Year

This course is an introduction to the concepts and practices of computer programming with an emphasis on program flow and structure. Instruction is in Java though the concepts taught are universal across programming languages. Note: Upon completion of this course, students will be prepared to enroll in AP Computer Science A. (There is a second prerequisite for IB Computer Science.)

IB Computer Science SL

12 Grade, Full Year

The IB Computer science SL course requires an understanding of the fundamental concepts of computational thinking as well as knowledge of how computers and other digital devices operate. The course, underpinned by conceptual thinking, draws on a wide spectrum of knowledge, and enables and empowers innovation, exploration, and the acquisition of further knowledge. Students study how computer science interacts with and influences cultures, society and how individuals and societies behave, and the ethical issues involved. During the course the student will develop computational solutions. Prerequisite -- Foundations of Computer Science (1, 2, and 3) AND Structured Query Language OR Instructor Permission.

Introduction Systems Programming

10, 11, 12 Grade, Full Year

Students in this course move beyond the abstractions of modern programming languages and learn how the computer understands and executes programs. In the first part of the course, students study the basics of assembly language (specifically, the 6502 chipset), the fundamental concepts of instruction processing, and byte-level memory architecture. In the second part of the course, students leave the world of modern Integrated Development Environments and learn to work with the terminal. Students learn to navigate the bash shell in Linux, write C programs using a basic text editor like Nano, and then compile and run those programs from the command prompt. In our C programs, we will focus our learning on how heap memory is used in programs, with a specific emphasis on understanding pointers. Students will also develop their understanding of data structures like array lists, linked lists, and stacks. The third portion of the courses focuses on computer networks, network programming, and threading. Prerequisite - Foundations of Computer Science (non-ATCS) OR Intro to Computer Science (ATCS) OR Instructor Permission.

Software Engineering

11, 12 Grade, Full Year

This course isn't a programming course, exactly. Although programming is a key Software Engineering skill, Software Engineering is a step removed from programming. SE explores how very large projects can be "engineered" to succeed even as they scale up to a massive degree. In this course, we explore how to make software scalable and maintainable, even when there are very large teams of people working together. We will focus on two key areas: test-driven development, which helps keep the software that has already been written from breaking even as many hands interact with it far into the future, and programming design patterns, which allow us to create scalable architectures that don't immediately degrade into "spaghetti code". The course itself will take place within Unity and C#, because game development is a great environment to make small-scale use of these larger patterns! While anyone is welcome to join us, this class was originally developed for ATCS Juniors, and AP Computer Science A is a strict prerequisite.

Web Apps with Databases

10, 11, 12 Grade, Full Year

This course is an introduction to the concepts and practices of developing web applications. Students begin by strengthening their skills in HTML, CSS, and browser-based JS, enabling them to create engaging web pages. Students then learn to query and update data in an existing MySQL database as well as to design and implement new relational databases. Finally, students will learn the process for building a full, data-enabled, web application – from design and prototyping to construction. Prerequisite- Foundations of Computer Science (non-ATCS) or Intro to Computer Science (ATCS).

Trimester Long Electives

Artificial Intelligence

11, 12 Grade, Trimester Long

This course is an intensive introduction to the broad field of Artificial Intelligence. We will be delving into several computational representations of knowledge and reasoning that have been influential in both cognitive science and software engineering. The focus will be on the comprehension and implementation of classic AI algorithms for problem solving agents. Topics include uninformed and informed search, adversarial search, and reinforcement learning, with sample applications including route planning and game playing. Prerequisite - AP Computer Science A.

Assembly Language Basics

10, 11, 12 Grade, Trimester Long

Students in this course move beyond the abstractions of modern programming languages and learn how the computer understands and executes programs. To accomplish this understanding, students study the basics of assembly language (specifically, the 6502 chipset), and fundamental concepts of instruction processing and byte-level memory architecture. Prerequisite- Intro to Computer Science (ATCS) OR Foundations of Computer Science (non-ATCS).

Computer Security

10, 11, 12 Grade, Trimester Long

Computer security is a vital element of today's world, with companies and governments all trying to defend, invade, and attack each other constantly. This course aims to provide students with the basic knowledge required to be involved in such a world. By learning how computers work at very low levels, students can become aware of how attacks are made in the digital sphere. This knowledge sounds frightening on its face, but it is important that we remain on the cutting edge of digital defense, and this course aims to give students a good foundation to serious studies in that arena. Prerequisite: Intro to C Programming or permission of instructor.

Foundations of Comp Science

9, 10, 11, 12 Grade, Trimester Long

Trimester 1: In this course, students are introduced to the Java programming language. Students learn console input and output, conditional expressions, while and for loops, and methods. Students learn the basics of the internal representation of values by the computer. Students practice the skills they acquire in this course by applying them to solve a variety of programming challenges.

Trimester 2: In this course, students are introduced to object-oriented programming, the design paradigm of nearly all modern software systems. Students learn to design objects having behaviors, properties, and inheritance. Prerequisite - Foundations of Computer Science 1 OR Instructor Permission.

Trimester 3: This course completes the Foundations of Computer Science sequence. In this course, students use ArrayLists and arrays to store sequences of data and develop an understanding of standard array and list patterns. Prerequisite - Foundations of Computer Science 2 OR Instructor Permission.

Front End Web Dev

9,10, 11, 12 Grade, Trimester Long

In this course, the students begin by learning to create basic web pages using HTML and CSS. The students then advance their skills to include animation, UX/UI design patterns, responsive design, and a more in-depth look at CSS, JavaScript, and standard Javascript libraries. Students incorporate these concepts in web sites they develop as projects in the class. Prerequisite- Foundations of Computer Science-2 (non-ATCS) or ATCS may take this course beginning 2nd trimester of 9th grade.

~Intro Web App Development

9, 10, 11, 12 Grade, Trimester Long

How do we design, build, and deploy applications on the web? What technologies can we use? What are the advantages and disadvantages of the available options? In this course you will design, build, and deploy your first web applications. Prerequisite - All students: Structured Query Language; Additionally for non-ATCS students: Foundations of Computer Science-2.

Machine Learning

10, 11, 12 Grade, Trimester Long

With more data than ever before, the world craves data-driven decisions in every sector of business. Machine Learning is a rapidly growing field of algorithms and statistical models to make decisions without explicit

programming, relying on patterns and inferences found in data instead. This course is an introduction to the discipline of machine learning, and a survey of popular supervised learning techniques. Prerequisite - Foundations of Computer Science (non-ATCS) or Intro to Computer Science (ATCS) .

~Processors

10, 11, 12 Grade, Trimester Long

How does a computer compute? It may surprise you to learn that, at the most basic level, computers don't work with numbers at all. In fact, they only do four things! You may have even met the four fundamental functions in your math class: AND, OR, XOR, and NOT. In this two-course sequence, you will build your own processor directly from these tools. Part One focuses on combinational logic, and culminates with the creation of your very own virtual version of the 1970s retro digital game "Lights Out". Co-requisite: AP Computer Science, Systems Programming, or Assembly Language Basics.

~Processors II

10, 11, 12 Grade, Trimester Long

How does a computer actually compute? It may surprise you to learn that, at the most basic level, computers don't actually work with numbers at all. In fact, they only do four things! You may have even met the four fundamental functions in your math class: AND, OR, XOR, and NOT. In this two-course sequence, you will build your own processor directly from these tools. Part Two focuses on processor architecture, and culminates in the creation of your very own processor. Requirements: Processors 1 ("Foundations of Computation").

Sockets and Threading

10, 11, 12 Grade, Trimester Long

This course introduces threading and sockets. Threading is a programming technique where a program has multiple simultaneous execution points. This technique can increase a program's speed by utilizing multiple processor cores and executing statements in parallel. Threading is also useful for building network-based applications, our primary focus in this class. Socket programming is a technique for communicating between two computer programs running on different computers and is necessary for creating network-based applications like chat servers or online games. This course is taught in Java. Prerequisite or Corequisite: AP Computer Science A.

Structured Query Language

9, 10, 11, 12 Grade, Trimester Long

Where and how do Google, Meta, and Uber store all their data? In databases, of course! In this elective, you will learn to design, update, and query relational databases using Structured Query Language (SQL). Prerequisite: ATCS students may take this course beginning 2nd trimester of 9th grade. Other academies: This course may be taken with or after Foundations of Computer Science-2.

Culinary

Core Courses

~Culinary Design

9, 10 Grade, Semester Long

This course explores an introduction to the art of cooking. Students will learn about both savory and sweet dishes while practicing safe food habits and maintaining a safe working environment in the kitchen. Students will be introduced to knife handling, basic cooking skills, and safety and sanitation procedures while also learning about weighing and measuring ingredients and different mixing methods used in baking.

Entrepreneurship & Advanced Culinary Arts

11 Grade, Full Year

This course is a course requirement for the ACAHA academy.

This course is designed to build on previous fundamental skills & knowledge developed in introductory 9th and 10th grade courses. This course will enhance the field of study of the two principal segments of the hospitality industry: food & beverage and lodging. The students will also build on their culinary theory principles to start to apply them to mastery. Entrepreneurship & Advanced Culinary Arts teaches flexible skills and applying knowledge creatively, which are essential for success in a Hospitality career. On-line ServSafe class will be administered.

Prerequisite: Hotel Management Culinary Theory.

Hospitality Management

12 Grade, Full Year

This course is a course requirement for the ACAHA academy.

The basics of an operational theory of hospitality management and culinary arts are presented under the functions of planning, organizing, staffing, and controlling. This course is administered throughout the year in conjunction with the National Restaurant Educational Foundation's ProStart Management Curriculum. This course will enhance the field of study of the principal segments of the hospitality industry including introduction of entrepreneurship and management. The students will be building upon their knowledge and skills and continue working towards the mastery of culinary practices and baking procedures. Prerequisite: Entrepreneurship & Advanced Culinary Arts.

Hotel Management & Culinary Theory

11 Grade, Full Year

This course is a course requirement for the ACAHA academy.

This course is designed to build on previous fundamental skills & knowledge developed in introductory 9th grade courses. This course will enhance the field of study of the two principal segments of the hospitality industry: food & beverage and lodging. The students will also build on their culinary theory principles to start to apply them to mastery. Hotel Management & Culinary Theory also focuses on the development of flexible skills, which are essential for success in a Hospitality career. Prerequisite: Introduction Hospitality Culinary Arts.

Introduction Hospitality Culinary Arts

9 Grade, Full Year

This course is a course requirement for the ACAHA academy.

In this course, students will get an overview of the many dimensions of the hospitality industry. The food, beverage and lodging segments of this industry will be explored as well as the historical foundations and the many career possibilities of the hospitality industry. Students will also receive exposure to the fundamentals of the Culinary Arts including safety, sanitation, knife skills, soup, and sauce preparation, etc....

Trimester Long Electives

~Culinary Design

9, 10, 11, 12 Grade, Trimester Long

Baking for the Holidays -- This specialty course offers students an opportunity to develop skills in baking traditional items for various annual holidays. Special emphasis is placed on desserts and ethnic treats which will impress your family and friends. All preparations are produced using the highest quality ingredients and are professionally presented. A research project may be a component of this culinary elective.

Classical French Cuisine -- This course offers students a view of classical cuisine from the different regions of France. Students will be exposed to a variety of techniques and ingredients that range from Bistro to Haute' cuisine. Various knife skills and cooking techniques will be utilized.

All About Chocolate-- This course is an introduction to chocolate, its properties, and the proper way of handling this delectable confection. Students will be instructed and guided in the hands-on execution of classical and decorative techniques. The use of pastry bags will be demonstrated, and the students will be given ample opportunities to practice these new skills.

World Cuisine -- In this elective, students will be exposed to cuisines of various countries around the world and a brief history behind the origins of the dish will be discussed. Students will be introduced to indigenous ingredients, spices, cooking styles and methods from regions around the globe. Basic cooking skills, knife handling, safety and proper food handling procedures will be stressed.. A research project may be a component of this culinary elective.

~ProStart Competition

11, 12 Grade, Trimester Long

This course is a course requirement for the ACAHA academy.

Students will demonstrate their knowledge of the restaurant and hospitality industry by developing a new restaurant concept including restaurant concept descriptions, menu, floorplan, interior/exterior design and décor, SWOT analysis, organizational chart, recipes/costing, and marketing tactics. Students will be exposed to the entrepreneurial aspects of the restaurant and hospitality business.

Engineering

Core Courses

Advanced Electrical Engineering

12 Grade, Full Year

This course will build on the intermediate electrical engineering course. This course will expand the use of operational amplifiers for interfacing sensors as well as designing active filters. Microcontrollers will be used for embedded control for switching high powers and driving motors. In addition microcontroller bus systems will be covered. Electronic Design Automation will be covered and students will enter schematics, assign part values, lay out circuit boards and generate Gerber files. The course will include many lab exercises to illustrate the operation of the circuits.

Computer Assisted Design

9 Grade, Full Year

Introduction to Engineering Design I (IED I) is a three trimester (two part) course which introduces students to topics including web page-based HTML codes, 2- and 3-dimensional computer aided design (2D & 3D CAD) and oral and written presentation. Students will learn by lecture, work-book exercises and independent and team projects and hands on tools. This course will give the inexperienced student the ability to understand the process of web design, learning Autodesk Inventor software, 3D Studio Max software, and the visualization tools of CAD in 2D and 3D. Successful completion of this course will allow students to move on to Introduction to Engineering Design II, where a more in-depth look at 3D CAD and animation occurs. IED I work hand in hand with the three-trimester course Technology I. Introduction to Engineering Design I will teach the students how to implement their projects while Technology I will assist in the research and content development portion. IED I is broken into four modules each covering several weeks. IED I Lab includes an introduction to basic hand tools, measuring instruments and the construction of simple wood and metal working projects.

Electronics

9 Grade, Full Year

Introduction to Electronics, is designed to introduce the student to the fundamentals of electronics and circuit prototyping. This course is helpful for learners who want to understand the basic components of electronics: diodes, capacitors, resistors, transistors, op-amps, TIP120 and IC-555 timers. The student will apply concepts

through labs and trimester projects and activities in conjunction with the design and testing of electronic circuits. The student will learn electronic theory and prototyping skills via a series of hands-on labs covering the bread-boarding and PCB fabrication of assorted circuits: IC-555 timer, TIP120 motor controller, parallel/series LED tester and charging circuit. The student will also explore the use of test instruments to verify and analyze electronic circuits they have prototyped.

Engineering Applications Programming

11 Grade, Full Year

The primary goal of this course is to increase synaptic connections of gray matter in the region of the frontal neocortex. By engaging in engineering challenges students will exercise and enhance these connections, which are responsible for creativity and ingenuity. These connections will be essential for a successful academic and professional career. This course will encompass methods for engineering analysis using MatLab and Fusion 360. MatLab will be used for modeling engineering problems for both analysis, simulation, and data presentation. These simulation methods will be further extended using the computationally intensive features of Fusion 360 for FEA (Finite Element Analysis) for stress, deflection, and thermal simulations. The engineering applications will include mechanical, dynamic, thermal, electrical, and financial problems.

Engineering Capstone

12 Grade, Full Year

Engineering Capstone builds upon the skills learned in I.E.D., P.O.E., Electronics, C.I.M., and traditional academic coursework and supports a project in a student's preferred area of engineering. Engineering Capstone includes the fabrication of student inventions, creation of architectural designs or participation in engineering competitions. Students research the need for a new or improved product of their own choosing; find similar products, make improvements, and develop a design brief. Creation of Engineering Drawings and 3D CAD files and animations lead students toward the final culmination with a working prototype and product presentation which describes, displays and helps sell the product i.e. to investors.

Electrical Engineering

11 Grade, Full Year

This course will cover the basic concepts in electrical engineering. The course will start with the basic relationships between the electrical variables Voltage, Current, Impedance and Power. The passive components will be covered including their basic relationships and dependence on physical parameters. The active components, diodes and transistors, will be examined in terms of the PN junction and how that relates to the operational parameters. Using data sheets to extract information will be covered. Operational amplifiers will be defined and used to build inverting and non-inverting amplifiers including testing them in a lab setting. Embedded control using microcontrollers will be introduced including writing code to perform simple tasks. The course will include many lab exercises to illustrate the operation of the circuits.

Introduction to Object Oriented Programming

10 Grade, Full Year

The Introduction to Object Oriented Programming course will introduce students to the Python programming language. The course focuses on developing algorithms and simulations of physical systems to develop a skill set applicable to many other programming languages. Introductory programming concepts, such as variables, operators, branches, loops, lists(arrays), functions, classes, user input, and output formatting will be covered. For analysis and simulation, students will write code to perform plotting, line-fitting, numerical integration, and simulation utilizing vector components.

Makerspace

9 Grade, Full Year

The Makerspace course will introduce students to engineering principles, mechanical drawing, materials, tools, equipment, and machining techniques. Students fabricate various items utilizing the metalworking equipment in the BCA Makerspace shop, such as a band saw, drill press, sander, arbor press, and buffing wheel. Students will utilize both tapped holes and self-clinching fasteners for assembly. Specific skills include using a drill and tap chart, marking out work, center punching, spot drilling, drilling, tapping, countersinking, and deburring. Students will further study business considerations for in-house production vs farming out production.

Makerspace Program

10 Grade, Full Year

Makerspace C programming introduces the students to Arduino C Programming language theory, commands, and architecture. The students learn the fundamentals of C programming in conjunction with Arduino hardware: Microcontroller, and sensors (i.e., temperature, tilt, Ping, PIR, pH, turbidity, Position sensors). to program the hardware and perform a series of tasks. The course is designed to instruct the students on how to prototype a circuit which can be controlled via an Arduino or Raspberry pi microcontroller. The students prototype an assortment of hands-on circuits which reinforce what they learned during lectures and software simulations. All assignments will be posted for the entire trimester in the Schoology Makerspace w/C programming folder. The student will also be taught how to use an assortment of simulation software (i.e., EasyEDA, Circuit Maker, and Queen University simulator).

Materials Tolerances

10 Grade, Full Year

This course is designed for students to learn materials and use in engineering and technology. Materials make modern life possible from the polymers in the chair you are sitting on, the metal ball-point pen you're using, and the concrete that made the building you live or work into the materials that make up streets and highways and the car you drive. All these items are products of materials science and technology (MST). Briefly defined, materials science is the study of solid matter, inorganic and organic. Students will be learning about the environment of MST reflects, material stress analysis properties and technical enterprise where scientists, engineers, and technologists work together to uncover knowledge and solve problems. Focus is on student driven projects with clear, analytical goals, accepted techniques for research.

Trimester Long Electives

BioEngineering

9, 10, 11, 12 Grade, Trimester Long

Bioengineering is one of the specialty courses in the Project Lead the Way® pre-engineering curriculum, which applies and concurrently develops secondary level knowledge and skills in biology, physics, technology, and mathematics. The major focus of the Biotechnical Engineering TM (BE) course is to expose students to the diverse fields of biotechnology including biomedical engineering, bio-molecular genetics, bioprocess engineering, and agricultural and environmental engineering. Lessons engage students in engineering design problems that can be accomplished in a high school setting related to biomechanics, cardiovascular engineering, genetic engineering, agricultural biotechnology, tissue engineering, biomedical devices, human interface, bioprocesses, forensics, and bioethics.

~Civil Engineering Architecture

9, 10, 11, 12 Grade, Trimester Long

Civil Engineering and Architecture is the study of the design and construction of residential and commercial building projects. The course includes an introduction to many of the varied factors involved in building design and

construction including building components and systems, structural design, stormwater management, site design, utilities and services, cost estimation, energy efficiency, and careers in the design and construction industry. The major focus of the CEA course is to expose students to the design and construction of residential and commercial building projects, design teams and teamwork, communication methods, engineering standards, and technical documentation.

~Design for 3D Printing

9, 10, 11, 12 Grade, Trimester Long

This course will teach the fundamentals of designing items for 3D printing. Students will learn to use Fusion 360 CAD (Computer Aided Design) software, DFM (Design for Manufacturing) techniques, and reverse engineering methods to design for 3D printing. The course will also touch upon considerations for future mass production using plastic injection molding for aspiring entrepreneurs. Students will finish with objects 3D printed from their designs.

Engineering Research

10, 11, 12 Grade, Trimester Long

Engineering Research is a chance to work on engineering projects in one of the engineering labs. This is applied research, and involves real engineering. Ideally, students will be working with professionals in the field who have a need or have offered to collaborate with us. For example, a researcher working on coral restoration has offered to test a prototype for us. Students will have access to the Electronics lab and electronic fabrication, the Mechanical engineering lab and mechanical fabrication as well as 3D printers and the facilities of the Makerspace. This is primarily for AEDT students that will be juniors in the fall, although students from other academies or rising sophomores with experience, will be considered. Students typically join an ongoing project, but new projects will be considered. Students should have a conversation with one of the engineering teachers prior to signing up.

Introduction to Robotics

9, 10, 11, 12 Grade, Trimester Long

This course provides an overview of robot mechanisms, electronic controls, Arduino and Raspberry Pi Micro controllers and basic electronics. Topics include motion planning; mechanism design for manipulators and mobile robots, multi-rigid-body dynamics, control design, actuators, and sensors; wireless networking, task modeling. Weekly labs provide experience with Servo, Micro controllers, Sensors (PING, PIR, and Infrared) and Lego NXT; Students will design and fabricate working robotic systems in a group-based trimester project.

~Medibotic

9, 10, 11, 12 Grade, Trimester Long

Medibotic program developed to provide you with enough information to understand how to construct and program the LEGO NXT Mindstorms robotic kit, how to build and program for specific simulated medical surgeries, and how to relate these surgeries to STEM areas.

MRL-Xploration

9, 10, 11, 12 Grade, Trimester Long

This course will introduce students to the fundamentals of electronics, micro controllers, and mechanical design. This course serves as a prerequisite for the Mechatronic Research Lab in room 146. Students will learn how to design and prototype circuits, identify electronic components and learn basic Arduino C- Programming. Tool usage and safety procedures are also covered. The course's goal will be for the students to gradually progress toward building their own circuit and prepare them for the Mechatronic Research Lab.

English

Core Courses

American Literature I

9 Grade, Full Year

This course consists of a genre-based study that explores American literary history. Issues of gender, class oppression, and alienation will be encountered as we explore connections of society's beliefs and the literature it produces. Through the literary genres such as novels, plays, essays, short stories, personal narratives, and poetry, techniques of critical analysis and interpretation will be introduced and then applied in classroom discussions, oral presentations, essays, and multimedia projects. The exploration in the course will enable students to appreciate the artistic as well as historical value of literature and develop the necessary skills to engage with it on a personal and intellectual level. These texts and their use will develop students' listening, speaking, reading, thinking, writing, and researching skills. A crucial component of this course is to develop and build upon the students' skills to become a satisfactory and confident writer and speaker.

American Literature II

10 Grade, Full Year

Students in this course will build on the skills and content covered in American Literature I and expect to become confident, critical readers and interpreters of literature; to develop proficiency in creating questions about what we have read and answering these questions through writing and class discussion; to engage in thought-provoking and intelligent discussion with the instructor and each other about the themes of the course and how they relate to their lives; and to compare different American authors' treatment of major themes that coincide with critical moments of American history. Students can expect to read longer works of fiction, poetry, short prose, and nonfiction essays and provide analyses on these texts. They can also anticipate substantial writing and revision of their own work as the year progresses. Both formal and informal assessments will be used to gauge student progress and growth throughout the year.

IB Literature I & II HL

11 & 12 Grade, Full Year

This is a two year course sequence in 11 and 12 grade.

11 Grade/Year I: Is designed to further develop skills in literary analysis and prepare students for successful completion of IB diploma/certificate assessments. It constitutes the first part of a two-year survey of literature from various cultures and time periods, focusing on the unique features of each work. During the year, students will strive to become more confident in all modes of writing, develop and participate in strong oral presentations, demonstrate mastery of advanced literary techniques, explore the historical contexts of class texts, and become independent in development and execution of IB assessments.

12 Grade/Year II: In the language A: literature course, students will learn about the various manifestations of literature as a powerful mode of writing across cultures and throughout history. They will explore and develop an understanding of factors that contribute to the production and reception of literature, such as: the creativity of writers and readers the nature of the interaction with the writers' and readers' respective contexts and with literary tradition the ways in which language can give rise to meaning and/or effect the performative and transformative potential of literary creation and response. Students will be involved in processes of critical response and creative production, which will help shape their awareness of how texts work to influence the reader and how readers open the possibilities of texts. With its focus on literature, this course is particularly concerned with developing sensitivity to aesthetic uses of language and empowering students to consider the ways in which literature represents and constructs the world and social and cultural identities.

IB Literature/Language I & II HL

11 & 12 Grade, Full Year

Prerequisite: American Literature I & II

This is a two year course sequence in 11 and 12 grade.

11 Grade/Year I: Language and literature course students will learn about the complex and dynamic nature of language and explore both its practical and aesthetic dimensions. They will explore the crucial role language plays in communication, reflecting experience and shaping the world. Students will also learn about their own roles as producers of language and develop their productive skills. Throughout the course, students will explore the various ways in which language choices, text types, literary forms, and contextual elements all affect meaning. Through close analysis of various text types and literary forms, students will consider their own interpretations, as well as the critical perspectives of others, to explore how such positions are shaped by cultural belief systems and to negotiate meanings for texts. Students will engage in activities that involve them in the process of production and help shape their critical awareness of how texts and their associated visual and audio elements work together to influence the audience/reader and how audiences/readers open the possibilities of texts. With its focus on a wide variety of communicative acts, the course is meant to develop sensitivity to the foundational nature, and pervasive influence, of language in the world at large

12 Grade/Year II: In this course, students study a wide range of literary and non-literary texts in a variety of media. By examining communicative acts across literary form and textual type alongside appropriate secondary readings, students will investigate the nature of language itself and the ways in which it shapes and is influenced by identity and culture.

World Literature I & II

11th & 12 Grade, Full Year

Prerequisite: American Literature I & II

This is a two year course sequence in 11 and 12 grade.

11 Grade/Year I: World Literature I Honors is designed to give students an understanding of literary masterpieces from the Ancient World to the Renaissance. Particular attention will be paid to the social, economic, cultural, and political forces that contributed to the creation of these texts. Although the emphasis will be on Western Literature, students will also be exposed to selections and samples of literature from around the globe. In addition to literary texts, major Literary Critical Theories will be studied and applied. Throughout the course, students will develop critical reading skills, as well as the analytical skills needed in academic environments. Building on the work of previous years, students will continue to hone their writing skills with particular attention to the formal essay and academic assignments.

12 Grade/Year II: World Literature II Honors focuses on literature from the 16th through the 21st centuries. Although great works of literature structure the course, careful attention is also devoted to the economic, political, social, philosophical, and cultural histories influencing the creation of these works. The way various writers' critique and humorously offer suggestions for improvement of their societies, issues of gender, class oppression, and alienation are encountered as connections between society's beliefs and the literature it produces are explored. Through novel, drama, essay, short fiction, and poetry, the techniques of critical analysis and interpretation are studied and applied in classroom discussions, oral presentations, research papers, and multimedia projects, etc. Throughout the course, students continue to develop the critical reading and analytical skills needed to achieve in academic environments. Building upon the work of previous years, students continue to hone their writing skills, paying particular attention to the formal and personal essay forms.

Trimester Long Electives

Creative Writing, I & II

9, 10, 11, 12 Grade, Trimester Long

Creative Writing I: For students new to creative writing as well as those who have already begun creative writing projects. Students will have opportunities to play with various creative writing concepts (character, setting, form) through various writing exercises to build a portfolio of new work. Students can also get feedback to refine their work and submit to various writing opportunities.

Creative Writing II: Juniors and seniors who have creative writing projects they have already begun will continue to revise and refine those projects, as well as start new ones, with peer and teacher feedback to develop drafts to submit to contests and other writing opportunities for young writers. Students will need to be open to feedback and willing to revise and rethink their work to refine it for outside adjudication.

~Introduction to Dystopian Literature

9, 10, 11, 12 Grade, Trimester Long

Students taking this elective will read and analyze literary texts of the 20th and 21st centuries from both America and abroad within the dystopian genre while practicing creative writing skills in the creation of their own dystopian story/stories.

~Introduction to Film Studies

9, 10, 11, 12 Grade, Trimester Long

In this elective, students will be given the terms and tools to appreciate and analyze films as both works of art and expressions of their social context. We will watch and discuss film clips from various time periods and parts of the world, focusing on how techniques combine in a way that invites viewer interpretations. We will also compare different versions of the same story and identify stylistic choices. During the last weeks of the course, students will have a choice of presenting an analysis of a chosen film or creating a short film that applies the techniques we have covered.

~Introduction to Journalism/~Advanced Journalism Workshop

9, 10, 11, 12 Grade, Trimester Long

Introduction: This elective focuses on the introduction and further development of journalistic techniques. Intro to Journalism provides a disciplined and structured environment for the processing of news with specific attention to supporting The Academy Chronicle, the official school newspaper.

Advanced: This portion of the elective allows students who have completed the Intro elective to begin to function as specialists within the scope of four critical areas of journalism: section managers and editors; graphic artists; technology managers; and senior staff writers.

Mythology

9, 10, 11, 12 Grade, Trimester Long

This elective focuses on the reading and analysis of world mythology to answer the central question, “Why do so many distinct cultures have similar myths?” Students will research parallels existing among world myths and explore the mythic world of archetype/symbol, noting parallels that exist among content, form, structure, and cultural importance. By studying critics who attempt to answer this same question, the student will be able to propose reasons for these similarities. Activities include exploration of various mythic forms such as: creation, the heroic journey, etc. Finally, students will evaluate the work of the critics considering their own research and create an original mythology using what they’ve learned during the trimester.

Nonfiction Writing

9, 10, 11, 12 Grade, Trimester Long

Creative nonfiction consists of "true stories, well told," or stories from our lives delivered with attention to craft and audience. In this class, students read model essays, respond to writing prompts, and practice multiple forms of creative essay writing, including the college essay. By the end of the trimester, students will have written at least two creative nonfiction works.

Playing Shakespeare from Text to Performance

9, 10, 11, 12 Grade, Trimester Long

This trimester elective will examine four Shakespearean plays: two comedies, *A Midsummer Night's Dream* and *As You Like It*, and two tragedies, *Romeo and Juliet* and *Macbeth*. As the plays are assigned for reading, the first class will examine why students have difficulty appreciating Shakespeare. A scene from "*Romeo and Juliet*" will be read by the students as the teacher directs them as if they are the actors in the play. Of course, students recognize immediately that the language is the obstacle. That becomes the thrust of the class: to have the students overcome the obstacle of Shakespeare's language.

~Poetry Workshop

9, 10, 11, 12 Grade, Trimester Long

Poetry Workshop is open to all students. It is a student-driven elective which provides the student-poet with the opportunity to explore and refine their creative writing skills. Various methods, forms, and techniques are considered and practiced in a comfortable, workshop atmosphere. Students will act as both editors and audience for one another. The project will culminate in a poetry reading of selected works by the project participants. If time permits, participants may wish to compile an anthology of finished pieces.

Science Fiction as a Literary and Film Genre

9, 10, 11, 12 Grade, Trimester Long

Designed to introduce a comprehensive, critical analysis of the unique literary genre of Science Fiction as a Literary Genre, it will use essays, short stories, and film. In identifying themes, concerns, and concepts as they emerge from readings, students will seek connections and correlations between the speculative realms presented in the texts, their cultures and technologies, and the observable worlds in which we live or know through history. Additional focus will consider the connection between the known and the unknown universe, which will result in invention and innovation, twists of perspective, and frequently unlikely relationships. Since Science Fiction has evolved through stages, the course follows a historical timeline beginning with the pioneers of Science Fiction (1920s), moving up through the formative years, and then looking to recent trends in the contemporary writing scene. The class includes writing, producing, and presenting a trailer for a science fiction movie.

~Songwriters Circle

9, 10, 11, 12 Grade, Trimester Long

This course will examine the connection between history, literature, and music by focusing on specific decades of American life. Each session includes historical, literary, and musical benchmarks. Additionally, students will analyze songs and songwriting styles. Students will also have time to work on their own compositions which will be performed in a Songwriter's Circle format at the conclusion of this course. Some proficiency on an instrument is preferred, though not required.

~Stories for Podcasting

9, 10, 11, 12 Grade, Trimester Long

This elective will give students the opportunity to create their own podcasts that tell personal stories of themselves or others. We will listen to samples from NPR's *Radio Rookies*, *This American Life*, *Freakonomics*, and *Generation PRX* as well as read texts from writers such as Studs Terkel, and Spalding Grey.

~The Personal Essay

9, 10, 11, 12 Grade, Trimester Long

Together, we will create a community of trusted feedback as we read a bit and write a bit more about ourselves. One student may be tackling the big task of preparing college essays, another reflecting and creating for other audiences, and yet another creating texts about themselves in multiple media. We will read model texts of all forms of creative nonfiction where writers explore and expose their identities. We will write from prompts as well as our own interests -- and share when we are comfortable to gain feedback. Grades will be earned based on a plan of production devised by the class rather than solely on the quality of the completed work.

Women in Literature

9, 10, 11, 12 Grade, Trimester Long

As we pursue the study of female characters in contemporary literary works and the women who create them, we will begin with Kate Chopin's *The Awakening* and look at shorter works by Charlotte Perkins Gilman and Virginia Woolf. Additionally, short works by contemporary women such as Toni Morrison, Alice Walker, Sandra Cisneros, and Amy Tan will be a resource. Students can explore the text, consider what is appealing about the characters, explore the effects of power or lack thereof, and analyze what being "different" does to a person. This elective includes an independent study of one female author for independent presentation. In addition to exploring text, students also research and explore how women's roles have changed over time by answering the question: Why do courses such as this exist.

International Baccalaureate

IB Core

Theory of Knowledge

11, 12 Grade, Full Year

This is a two year course sequence in 11 and 12 grade.

This course prepares students to explore and understand how knowledge is constructed in varied disciplines. Consider, discuss, and apply the core theme of "knowledge and the knower" as well as 5 areas of knowledge (AOK): mathematics, natural sciences, human sciences, the arts, and history. Apply the knowledge framework to develop questions about knowledge. The framework addresses: scope, perspectives, methods, ethics. Become more aware of and reflect critically on one's own perspectives, beliefs, and assumptions.

11 Grade/Year 1: Focus on 3 additional themes of knowledge and language and knowledge and indigenous societies.

12 Grade/Year 2: Focus on 2 additional themes of knowledge and technology.

Understand and use 12 key terms: evidence, certainty, truth, interpretation, power, justification, explanation, objectivity, perspective, culture, values and responsibility. Complete two major assessments that will be submitted to or moderated by IB: a 1600-word essay and an exhibition of three original objects, with explanations and reflections on "how do we know?" in many contexts and manners.

~IB Research Seminar

11 Grade, Trimester Long

In this one period per week session, students will be introduced to IB Extended Essay. Students will review the criteria for the IB Extended Essay, peruse sample essays, brainstorm ideas, discover sources, and write a research question which is central to the extended essay.

Math

Core Courses

Advanced Algebra

9 Grade, Full Year

This course is an attempt to cover all the basic concepts of elementary algebra. The topics covered are the following: Sequences and Linear Functions, Linear Systems, Function Families and Transformation, Working with Functions, Exponential Functions and Logarithms, Quadratics, Higher Degree Functions, Rational Functions, Trigonometry, and an Intro to Statistics. The two major folds of the course are to aid the student in acquiring the important manipulative algebraic skills and to help the student become fully prepared to take a mathematical analysis (Pre-calculus) course without any algebraic deficiencies. Although the course explores a modern structural approach, it is not extremely rigorous. The topics are developed on a level appropriate to the mathematical maturity and sophistication of the average student. The principles and procedures are stated clearly and concisely. Each chapter contains a series of learning units that enhance the student's understanding and connect the concepts to real world applications Note: As per incoming student placement test.

Advanced Math Analysis I

9 Grade, Full Year

We begin Advanced Analysis I with logic. In addition to being the "language of mathematics," students learn a process they can apply in almost any field: identifying underlying assumptions or known truths and building on them, with logical reasoning, until arriving at a desired conclusion. We continue with this concept as we study geometry. During this portion of the course, students will learn the formal (two column) as well as informal (paragraph) methods to prove a desired conclusion from a given known. In addition, they will develop an understanding of and comfort with geometric figures and a geometric approach to solving problems. Specific topics include congruent triangles, quadrilaterals, inequalities, similar polygons, right triangles (including trigonometry), circles, constructions, area and volume. Finally, for the remainder of the year, we will study topics that are largely considered "pre-calculus:" linear functions, quadratic functions and factoring, higher order polynomial functions and inequalities, functions in general, exponential and logarithmic functions and conic sections. Project topics may include constructions and linear programming. In addition to enriching a student's life, this course serves as the first in our two-course precalculus series.

Advanced Math Analysis II

10 Grade, Full Year

Advanced Analysis II (or Pre-calculus Honors) is designed to prepare students for either AP Calculus AB or BC, as well as the SAT IIC subject test. A main component of the course is the analyzing of functions (polynomial, exponential, logarithmic, and trigonometric) from a symbolic, tabular, and graphical perspective. Transformations and the composition of functions are covered as well. Other topics include sequences, series, polar equations, parametric equations, combinatorics, and probability. The concepts of limits, continuity, and derivatives are developed, and then applied to problems of optimization and related rates of change. In addition to content mastery, course goals include the development of students' problem solving skills, critical thinking skills, and the ability to prove theorems. Graphing calculators are used with selected topics.

Advanced Math Topics

12 Grade, Full Year

Embark in laying the foundation for all further serious mathematics and physics, studying the rudiments of linear algebra. Beginning with some familiar examples, we abstract the formal definition of a vector space. Adding a notion of length and angle enables Euclidean spaces to emerge and allows a brief foray into the rich topic of Fourier series and Fourier analysis. Now we are ready to abandon linearity and consider more general functions in

several variables, so-called scalar fields if the range is real, and vector fields if the range lies in a higher dimensional space. Everything reasonable can be approximated by a linear transformation. This is the theme of calculus, but it is much more clearly seen in a multidimensional setting. Derivatives become directional derivatives which become partial derivatives which can be assembled into the total derivative which is revealed to be a linear transformation! To give students a chance to get acclimated, we delve into some applications of derivatives, including some of the classical partial differential equations, and optimization. And then it is time for integration, a subject that can be generalized in at least three different directions. We tackle two of them, starting with line integrals. Students finally have the necessary mathematical tools to understand the correct generalization of the physics definition that $\text{work} = \text{force} \times \text{distance}$, a prime example of a line integral. Prerequisite: teacher recommendation

Advanced Pre Calculus Discrete

9, 10 Grade, Full Year

This course can be considered as a higher version of Advanced Analysis II; it deals with field and set proofs, induction, limits of sequences, trigonometry and complex numbers, linear algebra and calculus up through the applications of derivatives. Definitions are more rigid than those in AAIL, and students will be expected to do more sophisticated proofs.

AP Analyt Calculus (BC+)

11 Grade, Full Year

BC+ is a highly theoretical version of calculus; it covers all the basic material from AP Calculus BC with additional topics thrown in. The course is entirely proof based, though the students are still expected to be comfortable with the ordinary computations of calculus. The class starts with axiomatizing the real numbers; from there we go into what it means for a function to be integrable. This is followed by the notions of limits and continuity, and several important theorems are proved. We then get into differentiability and its applications, return to methods of integration, and then talk about sequences and series, culminating in a discussion of Taylor series. Prerequisite: teacher recommendation

AP Calculus AB

11, 12 Grade, Full Year

There are two main goals: an introduction to single variable calculus and preparation for the AP Calculus AB exam in May. Students learn the theory behind, the practice of, and develop an intuitive sense for topics which fall under the general headings of "limits", "derivatives", and "integrals." Some examples include finding the tangent line to a curve at a given point, finding the area of a region and the volume of a solid, finding maximums and minimums, finding the position, velocity, and acceleration of a body at any instant and finding the distance traveled by a body over a specified period. In AP Calculus AB, students will learn the theory needed to answer these questions and will solve many real-world problems of each of the types listed as well as many more. Prerequisite: teacher recommendation

AP Calculus BC

11, 12 Grade, Full Year

This course corresponds to the syllabus for AP Calculus BC determined by the College Board. The course is a full-year rigorous introduction to the fundamentals of differential and integral calculus, precisely formulated definitions, and problem-solving skills in developing general mathematical concepts. The course requires an extraordinary commitment on the part of the student. Students will be thoroughly prepared to take the BC Advanced Placement Exam and may be eligible to take Multivariable Calculus as the next level in the sequence of courses. Prerequisite: teacher recommendation

AP Statistics

11, 12 Grade, Full Year

Statistics is an introductory college-level statistics course that introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students cultivate their understanding of statistics using technology, investigations, problem solving, and writing as they explore concepts like variation and distribution, patterns and uncertainty, and data-based predictions, decisions, and conclusions.

Calculus I

11, 12 Grade, Full Year

Calculus I is based on the premise that there are four major concepts to be mastered - limit, derivative, definite integral, and indefinite integral. For each concept you should know the precise definition, have an intuitive understanding of what the concept means, be able to “do” the concept, and be able to apply it in the real world or mathematical world. There are four ways this knowledge can be obtained - numerically, graphically, algebraically, and verbally. By the end of the course, you will have learned algebraic methods for differentiating and integrating the elementary transcendental functions. These include trigonometric, logarithmic, and exponential.

IB Math HL

12 Grade, Full Year

This counts as a two year course sequence in 12 grade.

IB Math HL is a two-year curriculum designed by the International Baccalaureate Organization (IBO) in which you are given a grade based on tests (much like AP) and a mathematical essay (called a mathematical exploration). In BCA, your calculus course counts as the first year of the curriculum, and the rest of the curriculum is covered senior year in this course. The main topics covered in BCA’s senior year IB Math HL course are statistics, probability, vectors, complex numbers, proofs, binomial theorem extension, Maclaurin series, and differential equations. In addition, just about all topics previously learned in precalculus and calculus are reviewed throughout the year. Your mathematical exploration is written on a topic of your choice according to a rubric designed by IBO. This course requires a thorough knowledge of just about all mathematical topics learned throughout your four years at BCA. Many problems are non-routine and require a true understanding of the interconnectedness of many mathematical disciplines. This course meets four days a week and requires about 3-5 hours per week for homework, review of class work, study for assessments, and completion of the mathematical exploration. Prerequisite: teacher recommendation

IB Math SL

12 Grade, Full Year

This counts as a two year course sequence in 12 grade.

IB Math SL offers a broad range of topics and provides a solid background for students who anticipate future studies and careers in areas that involve mathematics such as chemistry, economics, psychology, and business administration without the rigor required for Math HL. The Math IB SL curriculum consists of 5 topics: number and algebra, functions, geometry and trigonometry, statistics & probability, and calculus. Your calculus course counts as the first year of the curriculum. In the senior year, this course will focus on modeling data, statistics, probability, the math exploration, and putting everything together for the IB Math (AA) SL exam. Your mathematical exploration is written on a topic of your choice according to a rubric designed by IBO. This course requires a thorough knowledge of just about all mathematical topics learned throughout your four years at BCA. This course meets three days a week and requires about 1.5 hours per week for homework, review of class work, study for assessments, and completion of the mathematical exploration. Prerequisite: Calculus 1 or higher Calculus course.

Linear Algebra & Differential Equations

12 Grade, Full Year

Linear Algebra and Differential Equations is structured to give students an introduction to college level Linear Algebra, including concepts about linear combinations, vector spaces, linear transformations, and eigenspaces and

the rigor of a college level class, as well as extending Calculus topics to enable students to solve several key varieties of differential equations. The Linear Algebra parts of the class empower the Differential Equations parts of the class, enabling students to understand the theoretical framework of the Differential Equation techniques. The class culminates in an analysis of systems of differential equations, including a full analysis of coupled linear systems as well as a practical approach to estimating solution curves of coupled nonlinear systems. Students are expected to create a major project at the end of the class. Prerequisite: Calculus AB or BC, or teacher recommendation

Math Analysis I

9, 10 Grade, Full Year

This course begins with a review of Algebra topics, such as sets, factoring polynomials, solving equations and simplifying algebraic expressions. We then move through Algebra II and Precalculus topics, including functions (linear, quadratic, polynomial, exponential, logarithmic, and trigonometric), with particular attention paid to graphing and answering analytical questions. Students are introduced to fundamental topics in Statistics, such as measures of center and spread and graphical representations of data. To end the course, important topics in Geometry are discussed, including congruence, similarity, angle relationships and polygons. Prerequisite: placement test.

Math Analysis II

10, 11 Grade, Full Year

In this course comprehensive coverage of topics provides solid preparation for college level courses in calculus, linear algebra, finite mathematical structures and probability and statistics. A balance of theory and its application, seen in numerous theorems, proofs, examples, and solutions enable students to read and write mathematics with understanding and precision. Abundant exercises reinforce theory, skills, and applications at three levels of difficulty. Applications show students how mathematics is used in related fields. Prerequisite: placement test, or by teacher recommendation.

Math Structures Proofs

9 Grade, Full Year

The course begins by covering mathematical and symbolic logic, to introduce the concept of forming a valid argument. These skills will then be used in a thorough axiomatic introduction to geometry, where we will start from the very basics to build up theorems about lines, angles, circles, triangles, larger polygons, and more, including some discussion of non-Euclidean geometries where the rules we may expect do not apply. We will also introduce trigonometry, in right triangles and general triangles. Afterwards, we switch to cover a variety of topics in algebra, building a foundation by defining functions, and learning how to work with and graph quadratic functions, polynomials, other conic sections, and the exponential and logarithmic functions. Finally, we introduce some basics of number theory, such as analysis of the divisors of a number, the Euclidean algorithm, other number bases besides decimal, modular arithmetic, and some important theorems. Prerequisite: placement test.

Multivariable Calculus

12 Grade, Full Year

Multivariable calculus is the equivalent of a typical third semester calculus course in a university calculus sequence. Students will learn to apply single-variable calculus concepts to vector and parametric functions as well as expand single-variable calculus concepts to functions of more than one variable. There is an emphasis on the practical applications of calculus to science and engineering, culminating in a unit focused on vector calculus and its applications. Students will also be introduced to the process of technical typesetting using the mark-up language LaTeX. Students will be introduced to the basics of using LaTeX to create professional quality technical documents. Prerequisite: teacher recommendation.

Statistics

12 Grade, Full Year

Statistics introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. The course is divided into four major themes: exploratory analysis, planning a study, probability, and statistical inference. Exploratory analysis of data makes use of graphical and numerical techniques to study patterns and departures from patterns. Data must be collected according to a well-developed plan if valid information on a conjecture is to be obtained. Probability is the tool used for anticipating what the distribution of data should look like under a given model. Statistical inference guides the selection of appropriate models. Throughout the course students will have hands-on and visual activities in the form of projects and experiments, ranging from M&M's to news broadcasts. Upon completion of this course students will look at the world differently because they will be able to construct an analysis of statistical data based on clear, critical thinking.

Full Year Electives

Data Structures

12 Grade, Full Year

The course is comparable to courses at universities that are usually titled "Algorithms and Data Structures." We begin with a review of what is often called discrete mathematics, slanting it so that it bears directly on the fundamental concepts of algorithms and data structures. Big-oh notation is introduced and emphasized immediately. We then proceed to the basic abstract data types of stacks, queues and binary trees and their implementations using arrays and linked lists. The idea of recursion is introduced in its proper context as the fundamental method for implementing algorithms on trees. Searching and sorting are the next topics, emphasizing binary search trees and hash tables. Dynamic programming and exhaustive search are considered next with plenty of diverse examples. Students are then ready for a more complex and versatile algorithmic idea, that of a graph, capturing the notion of connectivity. Finally, the year finishes with a discussion of NP completeness and the rudiments of the theory of computation. Throughout the course, there are opportunities to augment students' knowledge of C++ language syntax and basic programming skills.

Trimester Long Electives

~Advanced Math Topics

9, 10, 11, 12 Grade, Trimester Long

Miscellaneous advanced topics determined by student and instructor discussion. Prerequisite: teacher recommendation.

~Advanced Pre Calculus Discrete Extension

9, 10 Grade, Trimester Long

Discrete Mathematics II is a continuation of Discrete Mathematics I; we cover the material from Advanced Analysis II, but again with a few high level additions. We also introduce them to a reading/writing/research component. We start the course with the pre-calculus type topics – field and set proofs, limits of sequences and series, trigonometry, polar and parametric coordinates, and basic limits and derivatives. We also do some basic linear algebra. The next set of topics are combinatorics and probability and statistics. On top of this, we have a series of research/writing projects. In the first the students will write about a basic math subject they know very well; in the second, students will report on a research paper that we will read together as a class. For the third, the students will do a paper on a topic that is intended to take them beyond their comfort zone. The students will also learn to use a mathematical word-processing program like TeX. Note: This is an extension class.

~Analyt Calculus Extension

11 Grade, Trimester Long

BC+ is a highly theoretical version of calculus; it covers all the basic material from AP Calculus BC with additional topics thrown in. The course is entirely proof-based, though the students are still expected to be comfortable with the ordinary computations of calculus. The class starts with axiomatizing the real numbers; from there we go into what it means for a function to be integrable. This is followed by the notions of limits and continuity, and several important theorems are proved. We then get into differentiability and its applications, return to methods of integration, and then talk about sequences and series, culminating in a discussion of Taylor series. Note: This is an extension class.

Autodesk Fusion 360

9, 10, 11, 12 Grade, Trimester Long

This elective is not available for the AEDT academy.

This course, intended for students with little to no CAD or 3D modeling experience, will introduce the essential features of Autodesk Fusion 360. Students will learn how to draw, sculpt, render, assemble and animate their own 3D designs, as well as modify already existing 3D models. Applications to 3D Printing and other areas of student interest will be discussed.

~BC Calculus Extension

11, 12 Grade, Trimester Long

In depth explanations, discussions, and examples. Questions answered and complete problems solutions shown. Problems that extend the concepts of currently being studied in BC Calculus are presented to the students. Co-requisite for this course is BC Calculus & This is an extension class.

Cryptology

9, 10, 11, 12 Grade, Trimester Long

The course will be adapted to the level and backgrounds of the students. Some background in programming and knowledge of math beyond the Freshman level will enable topics to be covered in greater depth. Almost all of us use it almost every day and yet almost all of us are wholly ignorant of how it works. Cryptology is the study of how to communicate so that only the intended partners have access to the communication. Although the idea of secure communication is at least as old as Julius Caesar, it is only with the advent of computers that the field has matured to its current level. Old ideas in Mathematics have found new applications to encryption and cryptanalysis, and new capabilities of computations have enabled new types of ciphers and techniques of encryption. In this elective, some of the Mathematics underlying Cryptology will be studied with an eye to the techniques used to implement the encryption and decryption that is so pervasive throughout the Internet.

Game Theory

9, 10, 11, 12 Grade, Trimester Long

Game theory is a formalized structure for decision making, cost-and-benefit analysis, and all manner of related problems. In this class, we will discuss a number of mathematical games, from the classic Nim and Prisoner's Dilemma to variations on the former like Wythoff's Game and Hackenbush, and then some more complicated concepts like Nash equilibrium and the game of Domineering. We will also cover more familiar games and the ways they are similar to and different from the type of games we can study mathematically.

~Math Problem Seminar

9, 10, 11, 12 Grade, Trimester Long

This elective is aimed at Math research and math research competitions such as Regeneron, YSAP, NRSF and Google. Students will write math contributions in Combinatorics, Number Theory, Geometry etc. Students also prepare for math problem solving contests such as AMC 10,12, AIME, USA Math Olympiad and the International Math Olympiad.

Numerical Analysis

10, 11, 12 Grade, Trimester Long

This elective is an introduction to the techniques in Mathematics and Computer Science that are used to compute numerical results such as roots of equations and systems of equations, limits, definite integrals, and differential equations. The emphasis is on actually obtaining numerical answers or, if exact answers are unobtainable, suitable approximations. The techniques and methods introduced here lie at the intersection of Mathematics, which traditionally emphasizes existence of solutions, and Computer Science, with its emphasis on data structures and algorithms to manipulate data. Prerequisites: for this course are Intro to Computer Science (ATCS) or Foundations of Computer Science (non-ATCS).

~Skepticism in Data Analysis

9, 10, 11, 12 Grade, Trimester Long

Misinformation, disinformation, and fake news abound and it's increasingly difficult to know what's true. Professors Carl Bergstrom and Jevin West give in their book *Calling out BS, the Art of Skepticism in a Data – Driven World* a set of powerful tools to cut through the most intimidating data. You don't need a lot of technical expertise to call out problems with data. Are the numbers or results too good or too dramatic to be true? Is the claim comparing like with like? Is it confirming your personal bias? Some chapters that will be discussed are – Causality, Numbers and Nonsense, Selection Bias, and Data Visualization. Note: Inappropriate language will not be used in class.

Simulations & Numerical Methods

9, 10, 11, 12 Grade, Trimester Long

From meteorology to epidemiology, the world is full of phenomena that we *know* to be mathematical and numerical, but which are complicated enough that it's very hard to figure out exactly *how*. In this class, we explore how to build numerical models for quantitative systems, describe different kinds of such models, and use basic technological computation techniques to run simulations for how these complicated systems behave. Students will also have lessons on the basics of formatting mathematics into the syntax of technical writing. Grades will be based on three written paper submissions, with some options for presentations in place of an essay. Students who know how to code may have a leg-up, but it is not required. I will be using Excel or Google Sheets for all of my numerical modeling.

~Strategies in Mathematics

9, 10, 11, 12 Grade, Trimester Long

This course provides students with mathematical support based on their individual needs and is appropriate for students in a variety of core classes. Students will be provided opportunities for reflection on aspects of inquiry/problem solving, and the nature of mathematics with the goal of strengthening their understanding. Extra help and support, as well as, additional materials will be provided for students to use during their mathematical studies both in and out of class.

~Strategy of Card Games

9, 10, 11, 12 Grade, Trimester Long

A look at the history and mathematics behind a variety of social card games, such as Hearts, Euchre, and Cribbage. Students will learn the rules and get to practice playing the games, but we will also examine the probabilities involved, and learn some basic and intermediate strategies. Prerequisite: A basic understanding of probability and counting, such as covered in Analysis II, is recommended.

Music

Core Courses

Advanced Problems in Music Theory & Technology

11 Grade, Two Trimesters Long

This course is a core requirement for the AVPA-M academy.

A continuation of AP Music Theory in the Digital Age. Adv. Problems will involve the French, Italian, and German augmented sixth and Neapolitan Chords, composition of fugue expositions, continuing studies in counterpoint, including Twentieth-century counterpoint. Advanced harmonic analysis will include the late Romantic literature, and will begin analysis of Twentieth-century music. Also taken into account are: conducting knowledge, performance preparation, and ensemble skills. Due to the hands-on nature of the course, it is highly recommended, though not necessarily mandatory, that students have at least one year of piano study prior to beginning.

AP Music Theory in Digital Age

11, Grade, Full Year

This course is a core requirement for the AVPA-M academy.

Preparing students for the College Board AP Exam. However, it should be noted that the course does not merely "teach to a test." All portions of study are directly applicable to the student's musicianship. Beginning with the fundamentals of tone, intervals, and scale and triad construction, the course proceeds through phrase analysis and construction, Roman numeral harmonic analysis, non-chord tones, two-voiced species counterpoint, four-part chorale-style composition, the dominant and non-dominant seventh chords, vii-dim7 and their inversions, analysis of segments of the standard repertoire, and analysis of binary and ternary forms. It should also be noted that ear-training comprises nearly 50% of the exam, and is covered extensively in this course. Sight singing, melodic, harmonic, and rhythmic dictation, and listening analysis of orchestral literature comprise a sizable (roughly 40%) of the curriculum. Prerequisites: Due to the near constant hands-on nature of the course, it is highly recommended (though not necessarily mandatory) that students have at least one year of piano studies prior to beginning. However, exceptions are readily made in the case of instrumentalists with an intermediate or better level of proficiency on their instrument. Below these levels of proficiency, it is not recommended that students take the course.

Conducting

11, Grade, Trimester Long

This course is a core requirement for the AVPA-M academy.

Delves into conducting and score-reading. The course is meant to challenge a student and help them to grow, and therefore gets customized to the student's level. The course culminates in a rehearsal with one of BCA's major ensembles (band, orchestra, or choir). Prerequisite: Advanced Problems Music Theory & Technology, or teacher's recommendation.

Digital Keyboarding

9 Grade, Full Year

This course is a requirement to AVPA-M academy.

An open-ended course designed to fit the individual needs of the student. Beginner concepts, or for the advanced student, keyboard harmony (non-traditional clef reading, transposition, harmonization, and fundamentals of improvisation) are the main objectives. Typical class involves a three-to-five-minute session per student. Typical lessons are in two parts: performance of previous lesson's assignment (with corrections as needed), and the new assignment. In addition, students are introduced to the synthesizer and MIDI software. Instead of listening to the

piano sound bank in the synthesizer, students learn to access various keyboard sound files from “Finale” software, for example, a Steinway grand in an empty concert hall.

Digital Recording Lab

11 Grade, Trimester Long

This course is a core requirement for the AVPA-M academy.

Students in this course explore various elements of digital recording, audio equipment, and editing. Students will become familiar with various tools and equipment including microphones, cables, mixers, amplifiers, wireless systems, and troubleshooting. Students will run through recording sessions using the following platforms: Garage Band, Logic Pro, Soundtrap. They will edit the material and create a quality audio file for sharing. Projects may include audition material, original songs, formal compositions, arrangements, ringtones, and music videos. Note: If not taken as core music, may be taken as an elective.

Electronic Music Synthesis

12 Grade, Trimester Long

This course is a requirement to AVPA-M academy.

An applied music course involving fundamentals of MIDI, proceeding through more advanced concepts based on the general skill level of the students registered for the course. That is, it will be designed to fit the individual needs of the students to whatever extent that is possible. Hands-on practice and the production of an original composition using the software MIDI program Finale is the main objective of the course. The course is two trimesters long, taking place in the final two trimesters of each student's time at the Academies. The first three to four sessions involve an instructor-based presentation of the software, its capabilities, and the various methods, and skills the student will be expected to develop over the course of the course. The remaining weeks will involve an all-hands-on environment with only sparse teacher intervention to answer questions or to solve problems with hardware, etc. Prerequisites: Due to the near constant hands-on nature of the course, it is mandatory that students have at least six months of piano studies prior to the course. All AVPA music students are prepared for the course in Digital Keyboarding (9th grade), AP Music Theory in the Digital Age (10th grade), Advanced Problems in Music Theory & Technology (11th grade), Music & Society (11th grade), and Conducting (12th grade).

Musicianship

9 Grade, Full Year

This course is a requirement to AVPA-M academy.

Musicianship is a methods course where students learn to play woodwind, brass, string and several percussion instruments. Including the development of modern instruments and their transposition. Additionally, students explore conducting techniques and rhythm dictation. Prerequisites: ability to read music, permission of instructor. This is a required course for students in the AVPA-Music program (9th grade). Students will be able to conduct in all meters including 2, 3, 4, 5, 6 and 7. Additionally they will be capable of reciting and interpreting rhythm dictation exercises in those meters. Students learn to play one woodwind, brass, string instrument and guitar through the beginning level. They also learn several percussion instruments. This includes performing music in solo and ensemble settings. This course prepares students to be independent learners in all facets of music and prepares them for further study in any area of music.

World Music

11 Grade, Trimester Long

This course is a core requirement for the AVPA-M academy.

An arts and humanities course involving the historical development of Western music: its definition, origins, and the various basic genres (vocal, instrumental,) and its development over the ages, from its earliest beginnings in Antiquity and Gregorian Chant, through the Middle Ages, Renaissance, and Baroque periods.

Late 20th Century Music

11 Grade, Trimester Long

This course is a core requirement for the AVPA-M academy.

An arts and humanities course involving the historical development of Western music: its definition, origins, and the various basic genres (vocal, instrumental,) and its development during the Viennese Classical period.

Post-Romantic Music

12 Grade, Trimester Long

This course is a core requirement for the AVPA-M academy.

An arts and humanities course involving the historical development of Western music: its definition, origins, and the various basic genres (vocal, instrumental,) beginning in the Romantic period, continuing through Post-Romantic, and culminating in the 20th and 21st centuries.

Senior Music Media Seminar

12 Grade, Trimester Long

This course is a core requirement for the AVPA-M academy.

Senior Music Seminar has 2 units: First, it is a hands-on, “maker” style course where students construct an authentic musical instrument such as a Telecaster style guitar and mini amplifier. All facets in the construction process are included. Safe use of materials and tools are emphasized as students utilize planning strategies and incorporate interdisciplinary topics such as electronics. The experience culminates with an evaluation. Students take their completed projects home. In the second unit, seniors plan their AVPA-Music Senior Recital. The recital is a graduation requirement for the program and is adjudicated by professional musicians. Prerequisite: completion of an in-class “Safety Test” with a score of 100%.

Trimester Long Elective

~Advanced Problems in Music Theory

12 Grade, Two Trimester Long

Advanced Problems in Music Theory & Technology (referred to hereafter as Adv. Problems) is a continuation of AP Music Theory in the Digital Age. Adv. Problems will involve the French, Italian, and German augmented sixth and Neapolitan Chords, composition of fugue expositions, continuing studies in counterpoint, including Twentieth-century counterpoint. Advanced harmonic analysis will include the late Romantic literature, and will begin analysis of Twentieth-century music. Also taken into account are: conducting knowledge, performance preparation, and ensemble skills. Due to the hands-on nature of the course, it is highly recommended, though not necessarily mandatory, that students have at least one year of piano study prior to beginning.

~Concert Band

9, 10, 11, 12 Grade, Trimester Long

Concert Band is a large ensemble that performs formal concert music. Instrumentation includes wind and percussion instruments. Activities involving performance techniques, general musicianship and creative/critical thinking are emphasized during rehearsals. Concert Band runs only first and third trimester, and satisfies the participation requirement for county, regional and all-state honors ensembles. It is advised students check their calendars carefully, as those who participate in honors ensemble auditions and fail to participate in trimester 1 or 3 will not be permitted to audition the following year and lose their “good standing” status. Course prerequisites: because the ensemble is focused on performing more challenging music, all students must apply for a seat through an audition/selection process. Prerequisite: all students must audition.

~Concert Choir

9, 10, 11, 12 Grade, Trimester Long

A large ensemble of mixed voices -- NO AUDITION REQUIRED. The Concert Choir is featured in the Holiday and Spring Choir & Dance Concerts, performs at school functions, and participates in music festivals.

~Concert Choir (Lunch)

9, 10, 11, 12 Grade, Trimester Long

The same choir as the concert choir, but at lunch time. A large ensemble of mixed voices -- NO AUDITION REQUIRED. The Concert Choir is featured in the Holiday and Spring Choir & Dance Concerts, performs at school functions, and participates in music festivals.

Digital Recording Lab

11 Grade, Trimester Long

Students in this course explore various elements of digital recording, audio equipment, and editing. Students will become familiar with various tools and equipment including microphones, cables, mixers, amplifiers, wireless systems, and troubleshooting. Students will run through recording sessions using the following platforms: Garage Band, Logic Pro, Soundtrap. They will edit the material and create a quality audio file for sharing. Projects may include audition material, original songs, formal compositions, arrangements, ringtones, and music videos.

~ Ensemble

9, 10, 11, 12 Grade, Trimester Long

Wind Ensemble: BCA's chamber ensembles are comprised of accomplished musicians in smaller settings of 3-8 people: Flute Ensemble, Clarinet Ensemble, Saxophone Ensemble, Mixed Wind Ensemble (woodwind quintet), Brass Ensemble, Bergen Arts Ensemble (film, international, or experimental music). Ensembles may perform on campus and at special events off campus. Activities involving performance techniques, musicianship and creative/critical thinking skills are emphasized during rehearsals. Membership satisfies the participation requirement for county, regional and all-state honors ensembles. Course prerequisites: because the ensemble is focused on performing music in a selective and balanced setting, all students must audition.

String Ensemble: BCA's chamber ensembles are composed of accomplished musicians in smaller settings of 3-8 people: Piano Trio, String Quartet, etc.. Ensembles may perform on campus and at special events off campus. Activities involving performance techniques, musicianship and creative/critical thinking skills are emphasized during rehearsals. Membership satisfies the participation requirement for county, regional and all-state honors ensembles. Course prerequisites: because the ensemble is focused on performing music in a selective and balanced setting, all students must audition.

~Guitar I

9, 10, 11, 12 Grade, Trimester Long

Guitar Classes are comprehensive group lessons taking students through all facets of performing on the instrument. This is an academic course, not a club, so a consistent practice routine must be observed. The main goal of this course is to have students with no prior knowledge of guitar/music gain enough skills to begin playing independently. Topics include notation, tablature, chords/notes in first position, ensemble skills. Note: Must have an instrument.

~Guitar II

9, 10, 11, 12 Grade, Trimester Long

Guitar Classes are comprehensive group lessons taking students through all facets of performing on the instrument. This is an academic course, not a club, so a consistent practice routine must be observed. Prerequisite: Guitar 1 or teacher recommendation.

~Guitar III

9, 10, 11, 12 Grade, Trimester Long

Guitar Classes are comprehensive group lessons taking students through all facets of performing on the instrument. This is an academic course, not a club, so a consistent practice routine must be observed. Guitar 3: topics build on the previous course and include barre chords, fingerstyle playing, basic music theory. Students may also audition for Guitar & Mandolin Orchestra. Prerequisite: Guitar 2 or teacher recommendation.

~Guitar & Mandolin Orchestra

9, 10, 11, 12 Grade, Trimester Long

Guitar & Mandolin Orchestra (G&MO) is a large ensemble that performs music on acoustic guitars, bass guitars, mandolins, mandolas and mandocellos. Activities involving performance techniques, general musicianship and creative/critical thinking are emphasized during rehearsals. Membership satisfies the participation requirement for regional and all-state honors ensembles. Note: students who have successfully auditioned for BCA Orchestra on violin, viola, cello, bass can register without an audition. Prerequisite: all students must audition.

~History of Rock Music

9, 10, 11, 12 Grade, Trimester Long

A survey of rock music covering key figures that helped shape rock and roll from its infancy to the 1970s. Class sessions include original song recordings, video clips, documentaries, and class discussions of concurrent events in American history. Students will be challenged to look beyond the surface of the music and make connections between past and present events. History of Rock Music is open to any BCA student.

~Jazz Band

9, 10, 11, 12 Grade, Trimester Long

Jazz Band at BCA is a medium size combo of about 9-12 musicians. Activities involving performance techniques, general musicianship and creative/critical thinking are emphasized during rehearsals. Membership satisfies the participation requirement for county, regional and all-state honors ensembles. Prerequisite: all students must audition.

~Musicians Workshop

9, 10, 11, 12 Grade, Trimester Long

Students in Musician's Workshop build authentic musical instruments or electro-music devices. Almost all steps in the "maker" process are included from cutting wood to soldering electronics. Each term offers an engaging and ever-changing roster of projects! Team-work skills are emphasized as students utilize planning strategies and incorporate interdisciplinary topics such as math and physics. Safe use of materials and tools are emphasized. Materials fee.

~Music & Society

9, 10, 11, 12 Grade, Trimester Long

Music and Society is an arts and humanities course involving the historical development of Western music: its definition, origins, and the various basic genres (vocal, instrumental,) and its development over the ages, from its earliest beginnings in Antiquity and Gregorian Chant, through the various stylistic periods (Middle Ages, Renaissance, Baroque (first trimester); Viennese Classical period (second trimester); and the Romantic, Post-Romantic, culminating in the 20th and 21st centuries.

~Orchestra

9, 10, 11, 12 Grade, Trimester Long

Orchestra is a large ensemble that performs different styles of classical music. Instrumentation includes bowed strings with a limited number of winds/percussion- enough to comprise a traditional orchestra. Activities involving performance techniques, musicianship and creative/critical thinking skills are emphasized. Orchestra runs only first and third trimester and satisfies the participation requirement for regional and all-state honors ensembles. Note: It is advised students check their calendars carefully, as those who participate in honors ensemble auditions and fail to participate in trimester 1 or 3 will not be permitted to audition the following year and lose their “good standing” status. Prerequisite: all students must audition.

~Percussion Ensemble

9, 10, 11, 12 Grade, Trimester Long

BCA's chamber ensembles are comprised of accomplished musicians in smaller settings of 3-8 people: Flute Ensemble, Clarinet Ensemble, Saxophone Ensemble, Mixed Wind Ensemble (woodwind quintet), Brass Ensemble, Percussion Ensemble, String Ensemble (string quartet), Bergen Arts Ensemble (film, international, or experimental music). Ensembles may perform on campus and at special events off campus. Activities involving performance techniques, musicianship and creative/critical thinking skills are emphasized during rehearsals. Membership satisfies the participation requirement for county, regional and all-state honors ensembles. Prerequisite: all students must audition.

~Pit Orchestra I & II

9, 10, 11, 12 Grade, Trimester Long

Pit Orchestra performs original Broadway show music for the annual BCA musical. Instrumentation is dependent on the current show. A significant commitment is required since there are many after-school rehearsals and shows during the trimester. Pit Orchestra runs only the second trimester (last three mods on Monday, Tuesday, Thursday, and Friday) and satisfies the participation requirement for regional and all-state honors ensembles. Prerequisite: all students must audition.

~Ukulele Café

9, 10, 11, 12 Grade, Trimester Long

Ukulele Cafe is a beginning level course for ukulele (soprano and/or concert size instruments). Students will learn enough basics to start practicing and performing independently. The culminating experience is a luau-style performance. Note: students must have their own instrument.

Performing Arts

Core Courses

Acting I

9 Grade, Full Year

This course is a core requirement for AVPA-T academy.

This course is part of a four year sequence.

Students work with a series of physically based techniques and unscripted strategies such as Viewpoints and improvisation in order to release and open emotional and physical range. This work stimulates the imagination, puts emphasis on physical actions, encourages acting with the whole body, and aids in ridding the actor of self-conscious mannerisms. The work focuses on the actor and their creative powers.

Acting II/Playwriting/ Theatre History I

10 Grade, Full Year

This course is a core requirement for AVPA-T academy.

This course is art of a four year sequence.

In this course, acting, playwriting, and theatre history are taught concurrently as all inform the others. Acting emphasizes the rehearsal process through scene study with areas of focus including ensemble playing, emotional recall and sense memory, script analysis with a focus on dramatic content, values and style, characterization and scoring role. The interrelationship of actor and director in the rehearsal process is explored. Material is taken from modern American realism. Playwriting amplifies skills in creating given circumstances, character development and motivation, and dialogue with the culmination of writing a ten-minute play. Theatre History begins with Romanticism and ends with contemporary theatre practices, exploring major periods and trends in the theatre through an examination of performance environments, theatre architecture, design, acting styles, scripts, audiences and social and cultural conditions of the times.

Acting III

11 Grade, Full Year

This course is a core requirement for AVPA-T academy.

This course is part of a four year sequence.

The purpose of this course is to develop a close, organic connection between the actor and their technique. Each student is encouraged to investigate and utilize his or her widest possible range and to develop an individual method of work. All students will prepare 4-6 monologues drawn from contemporary and classical repertory and will explore audition technique in preparation for future training in college or conservatory or work in the profession.

Acting IV

12 Grade, Full Year

This course is a core requirement for AVPA-T academy.

This course is part of a four year sequence.

This advanced scene study class focuses on the exploration of the text and the utilization of technique to determine actor choices for the particular stylistic demands of a text and its period. Scene studies from a variety of major theatrical periods and styles are rehearsed, examining them in context of each play's content, structure, period, and movement to arrive at a valid character interpretation.

~Dance I

9 Grade, Two Trimesters Long

This course is a core requirement for AVPA-T academy.

This course is part of a four year sequence.

This two trimester course is the first component of a four-year dance study. One trimester consists of the study of ballet and the second trimester is the study of musical theatre jazz dance. Along with the fundamental positions, techniques, and steps of both ballet and jazz, students will develop an awareness of their body in space, an awareness of moving through space and an awareness of moving to music or musicality. In addition, along with proper dance technique, students will learn dance terminology as well as dance history. Dance study helps the young performer develop coordination and physical grace.

~Dance II

10 Grade, Two Trimesters Long

This course is a core requirement for AVPA-T academy.

This course is part of a four year sequence.

Consists of both ballet and tap dance. Students will practice and advance their technical ballet skills as well as learn ballet history. Emphasis will be placed on how to organize the body for movement. The second trimester will

consist of tap dance basics. During the tap dance unit, students will focus on musicality, weight change, and tap vocabulary. Both ballet and tap will help the student with their theatrical performances and musical theatre skills.

~Dance III - IV

11, 12 Grade, Two Trimesters Long

This course is a core requirement for AVPA-T academy.

This course is part of a four year sequence.

In the third and fourth year of dance, students begin to work on their artistry, performance technique, audition technique, and how to connect with an audience through the genres of ballet, tap, and jazz. Students will expand their knowledge and skill in each of the genres studied. Modern dance, movement improvisation, choreography and emotional expression through movement will be explored in this class along with modern dance history and historical choreographers. The culmination of four years of dance will result in a choreography project.

Directing

12 Grade, Full Year

This course is a core requirement for AVPA-T academy.

This course introduces the student to theory and techniques of stage direction. Basic director's concepts are studied and applied to scenes and short plays. Work includes: exercises in stage visualization, picturization, composition and movement; analysis of scenes with emphasis on the theatrical content of scripts; focus on director preparation in such matters as casting procedures, rehearsal technique and director/actor relationship; and choice and execution of production values (lighting, costume, sound). Student director's work culminates in directing a fully staged and produced one-act play.

~Junior Seminar

11 Grade, Trimester Long

This course is a core requirement for AVPA-T academy.

Through research, field trips, video conferences, and guest speakers students will explore theatre, film and television as a profession and as a business. Topics include portfolio preparation, resumes and pictures, union memberships, agents, job opportunities, auditions, interviews, and advanced training. Additionally, the college application as well as senior experience process is explored as students develop a college list, their resume and cover letter, and interview skills.

~Theatre Fundamentals

9 Grade, Semester Long

Theatre Fundamentals is designed to introduce non-AVPA/Theatre students to a general survey of dramatic principles and theatrical conventions. The course content is designed to increase the student's awareness of the performing arts and their impact on society. The major fields of dramatic art are examined through historical perspective, the functions of theatre personnel, and practices of the contemporary stage.

Theatre History I

10 Grade, Full Year

Beginning with Romanticism and ending with contemporary theatre practices, this course explores major periods and trends in the theatre through an examination of performance environments, theatre architecture, design, acting styles, scripts, audiences and social and cultural conditions of the times.

Theatre History II

11 Grade, Full Year

An historical exploration of global theatre arts in relation to developing Eastern and Western world civilizations, this course includes a study of theatre architecture, styles of acting, the development of stage costume and the range of dramatic literature from the Greeks through the closing of the theatre in Great Britain in 1642. Special emphasis

is placed on discovering how the institution of the theatre serves as an expression of social, economic, philosophical, religious and cultural movements of a specific historical period.

Voice & Speech I

9 Grade, Full Year

This course is a core requirement for AVPA-T academy.

This course develops the actor's vocal range and quality along with training in the use of standard American speech. Using the training techniques of the Alexander Method and the work of Cicely Berry and Kristin Linklater, students are introduced to a variety of physical techniques in order to release tensions and gain control over vocal range, placement and flexibility with a special emphasis on complex and classical texts.

Voice & Speech II

12 Grade, Full Year

This course is a core requirement for AVPA-T academy.

This course provides continued exercises and technique work. Emphasis is on vocal production and placement, breath control, articulation, regionalisms, dialects and projection as applied to scene and monologue work. Special emphasis is placed on Voice Over work in the industry with each student creating a voice over demo and given access to VO auditions. Prerequisite: Teacher recommendation and must have participated in at least one production at BCA.

Full Year Elective

~Fashion Design and Sewing

9, 10, 11, 12 Grade, Full Year

In this totally fun, hands-on ARTS elective, students will learn a number of sewing techniques and become comfortable working with high-end sewing equipment and tools. If you've ever seen Project Runway, this class will feel similar in the way we do "challenges". You might create a gown out of tin foil and rubber tires or solve a fashion dilemma for a client with a physical challenge! We bounce back and forth between real sewing projects developing technical skills and wacky, weird challenges where you can push your creativity and art-making in a safe, fun environment.

Trimester Long Elective

Beginner Ballroom

9, 10, 11, 12 Grade, Trimester Long

Are your social skills rusty? Do you need better communication skills? Try a Ballroom dance class. Learn to be comfortable in social settings by working on your communication skills. Listen to your dance partner by using the physical cues of leading and following. Practice your handshake while looking someone in the eye. Practice all these communication skills in a non-threatening, fun environment all while learning how to dance. Ballroom I will learn the Foxtrot, Rumba, and Swing and Ballroom II will learn the Tango and the Waltz. Leave your device behind and get ready to quick, quick, slow!!

Costume Design

9, 10, 11, 12 Grade, Trimester Long

What is a costume designer? What are the tools of the designer; the goals, techniques, expectations and procedures? This hands-on, really fun project-based class will go through the process of designing costumes for the Senior Directed One Acts. Student designers will learn about the stock here at BCA, research the play and period, take measurements, render designs, attend concept production meetings and rehearsals and work with the actors.

Student designers will co-create and maintain the entire costume design of the show. Designers will also create character boards and learn basic sewing. Homework in this class is not written. It is craft-based and design homework. Other than the final project, most work will be done in the classroom.

Dance Fundamentals

9, 10, 11, 12 Grade, Trimester Long

How do dancers balance, turn, leap, move quickly? Learn the secrets of dance training - alignment, musicality, coordination, change of weight, in a non-threatening environment. Have fun warming up while learning about core strength, stretching, isolations, and body alignment. Practice dance moves, turns and leaps across the floor in a supportive class. Learn fun routines but most importantly, stand taller with more confidence and grace as you become more aware of your physicality.

Latin Style of Dance

9, 10, 11, 12 Grade, Trimester Long

In this fun, energetic class, students will learn different Latin Ballroom dances by performing them solo. Some of the Latin dance styles that will be taught are the salsa, merengue, cha-cha-cha, rumba, bachata, mambo and the samba. The slower Latin dances will focus on strength and style while the faster paced dances will focus on change of weight, musicality, and change of direction. The class will start with a traditional warm-up that focuses on alignment, flexibility, and core strength.

~Musical Theater

9, 10, 11, 12 Grade, Trimester Long

In this course, student actors undertake the tasks necessary to produce a full-length, fully mounted musical theatre piece. Presentational musical theatre technique in acting, singing and dance is developed with rigorous attention given to ensemble building.

~One Act Play

9, 10, 11, 12 Grade, Trimester Long

This elective is designed to give the student hands-on experience in acting techniques, character analysis, proper staging, costuming, prop making and scenery design, through the vehicle of a one-act play. Students audition for roles, memorize and rehearse lines, make costumes, produce and gather props, design and construct scenery, and present the play during an evening play festival. Directors of these plays are all AVPA: Theatre Seniors. The experience provides a fitting culmination for the work of the AVPA: Theatre student.

~Public Speaking

9, 10, 11, 12 Grade, Trimester Long

Do you get nervous anytime you have to speak in front of others? Are you comfortable but want to get better at it? Come practice your public speaking skills in a fun and supportive environment where everyone will improve regardless of their starting point.

Screenwriting

9, 10, 11, 12 Grade, Trimester Long

This elective examines the role of the screenwriter in TV and film. Students will study the works of professional screenwriters and closely investigate the different processes of writing for TV, film and other screen media. Throughout the study, the students will also write their own short screen- or teleplay.

~Stage Management

9, 10, 11, 12 Grade, Trimester Long

Love theatre and film but HATE the idea of being on stage or in front of the camera? Are you super organized and kind of enjoy being in charge? Love the arts but maybe not MAKING the art? We need you in stage management!

Students will: work on the fall play during the elective hour, learn to work with costumes, props, sets, sound and lights, read drafting, work on the stage, analyze the play, meet with the director and design teams, organize schedules, run technical rehearsals, work with the actors, develop protocols and above all work collaboratively with a wide variety of people. This would count towards an arts elective.

~Stretching and Pilates

9, 10, 11, 12 Grade, Trimester Long

Do you need space to breathe, re-group, de-stress? Find your inner calm in a quiet space where you can focus on your body. Pilates is a somatic practice, (mind-body exercise), developed by Joseph Pilates in the beginning of the 20th century. Pilates is a controlled, low impact, exercise discipline that focuses on core strength, flexibility, and alignment. Students will gain awareness of their alignment and will begin to realize how certain negative postures can have an impact on their overall health. This once per week class is based upon the classic Pilates mat series.

~Theatre Production

9, 10, 11, 12 Grade, Trimester Long

This course is designed to give the student actor an opportunity to develop acting skills, learn character analysis, and to participate in the staging, costuming, and scenic design for a full-length play.

~Yoga

9, 10, 11, 12 Grade, Trimester Long

In this once per week class, students will explore the mindful movement that is yoga. The definition of yoga is 'to yoke' or to unite. The class will focus on uniting the breath with mindful movement, and the body with the mind. At the beginning of each class, students will be asked to focus on an intention such as gratitude, compassion, or presence. The class will start with a settling-in practice of community breathing and gentle spinal articulations. We will start to build heat by practicing sun salutations, warriors, twists, and balances. We will begin to cool down with a series of backbends and then end with supine poses and finally a relaxation. In this course, there will be opportunities for exploring and learning about oneself and how to maintain a healthy yoga lifestyle.

~Yoga Lunch

9, 10, 11, 12 Grade, Trimester Long

Do you need time to slow down, re-group and de-stress? Try a Yoga class where you can breathe, balance and be tranquil. In this Yoga class, students will learn a series of Yoga postures that begin with gentle spine work and end with relaxation. In between, students will be exposed to various yoga balances, twists and inversions. The alignment principles of each posture as well as the health benefits of each posture will be taught. Emphasis will be placed upon opening the body instead of holding tension. Yoga is for everyone and everybody, mats are provided.

Physical Education, Health & Driver's Education

Core Courses

~Driver's Education

10 Grade, Trimester Long

This course is designed to prepare students to take the NJ Department of Motor Vehicles' written exam—a student's first step in obtaining his or her driver's permit. Topics include making effective driving decisions, understanding motor vehicle and traffic laws, learning basic maneuvers, and the safe operation of a vehicle. The NJ State DMV written exam will be administered in class.

~Health - First Aid Online

11, 12 Grade, Full Year

Family Living curriculum has been developed to educate each student to the four categories outlined by the New Jersey Department of Education: Wellness, Integrated skills (communication, decision making, goal setting, etc.), Drugs and Medicines and Human Relationships & Sexuality. This course aims to increase student knowledge about Wellness, Drugs and Medicines as well as Human Relationships & Sexuality through the use of integrated skills which will provide the student with the essential steps towards taking the responsibility for one's own health, relationships and lifestyle choices.

Health & Wellness

9 Grade, Trimester Long

The Health & Wellness course provided to 9th grade students covers a wide range of topics related to nutritional wellness, sexual health, and a variety of current health issues. Nutritional wellness, combined with physical activity, will provide students with an understanding of the importance of having a healthy and a balanced diet that contributes to personal growth and human development. Additionally, students will learn about topics that are related to social and sexual health. Learning and understanding the importance of health-enhanced behaviors helps reduce health risks and avoid diseases contributing to the student's personal growth and development. In this course, students will take part in research and projects related to various health topics. This course will also educate each student in the four categories outlined by the New Jersey Department of Education: Wellness, Nutrition, Drugs and Medicines and Human Relationships & Sexuality.

~Health & Wellness

11, 12 Grade, Full Year (online)

Advanced Topics of Health and Wellness 1: The intent of this course is to provide the students with the knowledge and skills necessary to recognize and handle a medical emergency. Upon completion of this course students will be able to identify ways to prevent injury or illness, recognize when an emergency has occurred, follow three emergency action steps in any emergency, provide basic care for injury or sudden illness until the victim can receive emergency medical help. Moreover, the student, as a lay responder, will feel more confident in his or her ability to act appropriately in the event of an emergency. Students will be involved in research and projects. This course will also educate each student to the four categories outlined by the New Jersey Department of Education: Wellness, Integrated skills (communication, decision making, goal setting, etc.), Drugs and Medicines and Human Relationships & Sexuality.

Advanced Topics of Health and Wellness 2: This course is designed to explore the following topics – interpersonal relationships, foundations of human growth and development, responsible personal behavior, and family living. Students discuss, examine, and formulate their own conclusions and values concerning these topics. Students will be involved in research and projects. This course will also educate each student to the four categories outlined by the New Jersey Department of Education: Wellness, Integrated skills (communication, decision making, goal setting, etc.), Drugs and Medicines and Human Relationships & Sexuality.

~Physical Education

9, 10, 11, 12 Grade, Trimester Long

The physical education course at the Academy is designed to contribute to the well-being of the student physically, intellectually, emotionally, psychologically and socially. Emphasis is placed on personal fitness and the pursuit of lifetime activities. Education on the physiology of exercise is integrated into the course so that students have a better understanding of the relationship between exercise and their well-being. A scientific approach to human physiology is emphasized.

Physics

Core Courses

Advanced Physics

11 Grade, Full Year

This course is a core requirement for the AAST academy.

This algebra-based course provides the fundamentals of magnetism, wave phenomena, optics, special relativity, and modern physics (quantum, nuclear and particle physics). Problem solving and laboratory work are emphasized, requiring the student not only to master concepts and equations, but to also apply them in many varied situations.

AP Physics C

11, 12 Grade, Full Year

May be selected to satisfy the 11 grade full year physics requirement.

Is the calculus-based physics course designed for all college physics/engineering freshmen. Students are expected to either have already completed one year of calculus before taking this course, or are scheduled to take Calculus AB/BC concurrently with this course (BC is strongly recommended). A strong "A" average in the previous physics course is also expected. AP Physics C is divided into two sections: Mechanics and Electromagnetism. Many, but not all, of the concepts taught should already be familiar to the students, but will be discussed at a much more sophisticated level. Students must have the problem-solving skills necessary to generate both numerical and symbolic solutions to questions. Laboratory assignments will also be given periodically, as lab based questions have been added to the AP exam in recent years. Students will master gathering, analyzing, presenting, and interpreting physical data. Findings will be presented in formal lab reports. Note: If not taken as core physics, may be taken as an elective .

Physics

10 Grade, Full Year

This course is a core requirement for the AMST academy.

This course helps students to develop the skills and vocabulary required for success in understanding of the physical world around us. The language of mathematics is used to describe the topics of Motion, Forces, Energy and Momentum. Problem solving techniques are primary throughout the course. The directional properties of Displacement, Velocity, Acceleration , Force and Momentum are emphasized along with the techniques needed to analyze them. Projects, experiments, labs and problem solving are the major tools used to achieve understanding of the course material. In addition, a great deal of modern technology is used to promote visualization and to create more interest and excitement. Students will participate in several different types of activities. Labs provide hands-on learning experiences that help to personalize the course content. Demonstrations can often be performed with student involvement, which can increase enthusiasm. Of course, problem-solving exercises are implemented to strengthen thinking and reasoning skills. Often, these may be done by groups so that the students can collaborate.

Physics

11 Grade, Full Year

This course is a core requirement for the AMST academy.

This course includes units on fluids, thermodynamics, electricity, magnetism, waves, and optics. Learning will occur in a variety of formats, including problem-solving groups, individual work, and hands-on activities (labs). The course is designed to challenge the learner to take initiative in trying to explain a wide variety of phenomena. Modern technology will be employed to enrich the student's experience. The course includes numerous labs. Just to name a

few, there are labs on buoyancy (trimester 1), electric current (trimester 2), and lenses and mirrors (trimester 3).
Note: All students taking this course should be proficient in algebra.

Physics

11 Grade, Full Year

This course is a core requirement for the ACAHA, ABF, ATCS and AVPA academy.

This course includes units on vectors, kinematics, Newton's Laws of Motion, gravity (and uniform circular motion), energy, momentum, electricity, magnetism, waves, and optics. Learning will occur in a variety of formats, including problem-solving groups, individual work, and hands-on activities (labs). The course is designed to challenge the learner to take initiative in trying to explain a wide variety of phenomena. Modern technology will be employed to enrich the student's experience. The course includes numerous labs. Just to name a few, there are labs on friction (trimester 1), electrostatics (trimester 2), and refraction (trimester 3).

Physics I

9 Grade, Full Year

This course is a core requirement for the AEDT academy.

This course covers topics of study in Motion, Forces, Energy and Momentum. Students will apply problem solving techniques to engineering and physics scenarios throughout the course. The directional properties of Displacement, Velocity, Acceleration, Force and Momentum are emphasized along with strategies and techniques required to analyze them.

Physics II

10 Grade, Full Year

This course is a core requirement for the AEDT academy.

This course exposes students to the concepts and principles of Rotational Motion, Ideal Gas Laws and Kinetic Theory, Heat, Thermal Expansion Thermodynamics, and Electrostatics. The course is algebra-based, and it emphasizes several components: knowledge of the basic laws of nature, the ability to apply that knowledge to a particular phenomenon, and the ability to achieve a complete experimental and theoretical explanation of the phenomenon. Great attention is given to the connectivity between the sciences. Students will participate in several different types of activities. Labs provide hands-on learning experiences that help to personalize the course content. Demonstrations can often be performed with student involvement, which can increase enthusiasm. Of course, problem-solving exercises are implemented to strengthen thinking and reasoning skills. Often, these may be done by groups so that the students can collaborate.

Full Year Electives

Advanced Physics for Engineering

11 AEDT, 12 Grade, Full Year

This algebra-based course provides the fundamentals of magnetism, wave phenomena, optics, special relativity, and modern physics (quantum, nuclear and particle physics) and will prepare students to take AP Physics C senior year or enter college engineering programs. Problem solving and laboratory work are emphasized, requiring the student not only to master concepts and equations, but to also apply them in many varied situations. Prerequisite: Physics II (AEDT students) or Physics (non-AEDT students).

AP Physics C

11, 12, Grade, Full Year

Is the calculus-based physics course designed for all college physics/engineering freshmen. Students are expected to either have already completed one year of calculus before taking this course, or are scheduled to take Calculus AB/BC concurrently with this course (BC is strongly recommended). A strong "A" average in the previous physics

course is also expected. AP Physics C is divided into two sections: Mechanics and Electromagnetism. Many, but not all, of the concepts taught should already be familiar to the students, but will be discussed at a much more sophisticated level. Students must have the problem-solving skills necessary to generate both numerical and symbolic solutions to questions. Laboratory assignments will also be given periodically, as lab based questions have been added to the AP exam in recent years. Students will master gathering, analyzing, presenting, and interpreting physical data. Findings will be presented in formal lab reports.

Trimester Long Electives

Astronomy

9, 10, 11, 12 Grade, Trimester Long

Astronomy is the study of the planets, the stars, and, ultimately, the entire universe. All sorts of questions arise from this study. What is the origin of the Earth? What is the origin of the Solar System? What is the origin of the Universe? What is the Copernican Revolution? How do we know that planets orbit the Sun? Where does a star's energy come from? How do we measure distances in space? What is the fate of a star like the Sun? What is a supernova? What is a black hole? How does telescopic observation enable us to verify predictions of Einstein's Theory of Relativity? What kinds of instruments both on the ground and in space do we use to observe the cosmos? Units include the history of astronomy (where we learn of struggles, setbacks and achievements of earlier generations), the Solar System (where we learn about our home star and the planets, asteroids and comets that orbit it), and stars and galaxies (where we learn about the incredible variety of stars and collections of stars). We will also follow one of the most exciting ongoing endeavors in astronomy, the search for extrasolar planets. Instead of a textbook, we will rely on the tremendous resources of the Internet, which has become something of a virtual telescope. We can, for example, download a variety of photographs from the Hubble Heritage site.

Astrophysics

9, 10, 11, 12 Grade, Trimester Long

Astrophysics is a one-trimester introduction to the physical principles behind celestial phenomena, from planetary motion, to the inner workings of stars, to the nature of the universe. Students need not have completed or be enrolled in any physics course (as all necessary physics principles are discussed at the start of the course), although one would be helpful.

Automotive Dynamics & Engineering

9, 10, 11, 12 Grade, Trimester Long

Students will have the unique opportunity to study, analyze and construct solutions to engineering design problems within the automotive industry. This will include the deconstruction and analysis of the hard part: design, and function. Students will modify, plan, and execute unique authentic redesigns to existing materials and offer solutions to common issues within the industry.

Einstein's Relativity

9, 10, 11, 12 Grade, Trimester Long

Einstein's Relativity is a one trimester elective open to all students, that introduces the concepts of both Einstein's theories of special and general relativity. Students are not required to have had a previous physics course, although one would be helpful.

Earthquake

9, 10, 11, 12 Grade, Trimester Long

The Earthquake Elective admits the student to the awesome realm of the earthquake—the sudden, violent shaking of the ground that can be caused by forces deep in the earth or a volcanic event. We will learn how to measure the

energy released in an earthquake as well as the extent of the damage. We will see how seismic waves passing into the Earth make it possible to discover details of the structure of the Earth.

Intro to Volcanology

9, 10, 11, 12 Grade, Trimester Long

Introduction to Volcanology is a course designed to provide the student a broad picture of volcanism. Topics of study include types of volcanoes, types of lava, causes of volcanoes, and the detrimental and beneficial effects of volcanoes. (Detrimental effects usually grab the headlines, but volcanoes do have their beneficial effects; for example, the rich soils of Hawaii are the result of volcanism.) There will also be studies of specific volcanic eruptions, such as the one in 79 C.E. that buried Pompeii.

~Math for Physics

9, 10, 11, 12 Grade, Trimester Long

Whether you are in a Physics class this year or will be in the near future, you might experience – or anticipate that you might – some difficulties with Mathematics as it is applied to problem-solving in Physics or feel that you need to sharpen your skills or learn about mathematical facts, concepts, and techniques most frequently used. The goal of this course is to help you in all these situations. The topics include Geometry, Trigonometry, and Advanced Algebra; Calculus can be added upon students' request.

~Physics Explor

9, 10, 11, 12 Grade, Trimester Long

Physics Exploration is a one trimester course for students from all Academies. Students explore selected topics in depth, with the emphasis on related experiments and problem solving skills. Possible topics include classical and quantum mechanics, thermodynamics, electromagnetism, optics and relativity. The background and needs of students will be evaluated each trimester to determine actual topics to be covered.

Physics in Medicine

9, 10, 11, 12 Grade, Trimester Long

The elective is open to all students intrigued by the medical and physical aspects of bodily functions in living organisms as well as those incorporated in diagnostics and treatment. Among other things, this elective will address topics not discussed in core Physics classes but included in the MCAT and similar exams. Previous experience in Physics is helpful but not required.

Physics of Music

9, 10, 11, 12 Grade, Trimester Long

The Physics of Music explores how principles of physics illuminate the art of music. Topics include basics of waves, the characteristics of sound waves, how vibrations generated by a taut string can generate waves that can be sensed by the ear, the nature of harmonics, resonance in open pipes and closed pipes, the pattern of frequencies in scales such as the Pythagorean Scale, the Just Scale, and the Equal Tempered Scale, how different instruments have different timbres, and the range of sound intensity levels measured in decibels. A knowledge of music is helpful, but rudiments of musical notation are included in the course. Knowledge of algebra is required for this course.

Quantum Mechanics

9, 10, 11, 12 Grade, Trimester Long

This elective will be math-based as opposed to a conceptual introduction. Students will initially be introduced to the key concepts of Quantum Physics: wavefunctions, measurements, quantum states. This will be followed by the application of these principles to various systems using a mathematical framework. Mathematical tools will be utilized frequently and it is necessary to have a prior knowledge of differentiations and integrals. We will study the solutions of Schrodinger's equation in various cases, do a brief survey of linear algebra and complex numbers; and

develop the abstract framework to study the applications of quantum theory. If you appreciate/enjoy the usage of calculus, you will see plenty of applications in this course.

Quantum Physics

9, 10, 11, 12 Grade, Trimester Long

This course is a conceptual introduction of Quantum Physics. Students don't need to have a prior knowledge of the subject. The goal of the course is familiarizing students with the basic principles of quantum physics, and how it is different or peculiar in its essence from our everyday experience. The material will be presented in a qualitative manner, and the use of mathematics will be kept to a minimum; so it is open to all grades and academies. We will explore the following topics: early experiments that led to the emergence of quantum physics (Blackbody Radiation, Photoelectric effect), wave-particle duality, quantum states and operators, entanglement, the interpretation of the double-slit experiment, and the uncertainty principle. Assessments will be based on in-class quizzes and homework. This course also serves as a preparation for the "Quantum Mechanics" elective that utilizes mathematical tools.

~Science Olympiad: Get Ready

9, 10, 11, 12 Grade, Trimester Long

The elective is for students interested in the Science Olympiad contest and willing to get better prepared for the in-school trials and/or the contest itself. Students will be working on the events of their choice, both theoretical and building, alone or in a group. The instructor will facilitate students' work, provide guidance, and arrange assistance from other subject teachers as much as possible.

Sports Science

9, 10, 11, 12 Grade, Trimester Long

This course offers the opportunity for students to learn and apply physics and engineering knowledge to understand and enhance interactions within sports and other activities. Students will be able to focus on their own extra curricular activities and interests to facilitate learning. Projects will focus on the application of science to understand and enhance performance and hone skills.

Psychology

Full Year Elective

AP Psychology

12 Grade, Full Year

AP Psychology introduces students to the systematic and scientific study of human behavior and mental processes. While considering the psychologists and studies that have shaped the field, students explore and apply psychology theories, key concepts and phenomena associated with topics such as the biological basis of behavior, sensation and perception, learning and cognition, motivation, developmental psychology, testing individual differences, treatments of psychological disorders and social psychology. Throughout the course, students employ psychological research methods, including ethical considerations, as they use the scientific method, evaluate claims and evidence and effectively communicate ideas.

Social Studies

Core Courses

IB History of American I & II HL

11, 12, Grade, Full Year

This is a two year course program.

11th Grade/Year One: The IB American Studies course is a comparative course that will integrate the history of the Western Hemisphere from colonization through the 20th Century. The students, during this course, will explore the common experiences in the Americas through a comparative study of economic, political, social and cultural issues. The course will pull from the twenty-two International Baccalaureate regional study topics for History of the Americas. Students will be assessed in a variety of ways, including through the completion of projects, essays, objective and subjective tests.

12th Grade/ Year Two: The Higher Level History Program at the Bergen Academies consists of one course (Higher Level IB History) split over two years. During the year one of the course students will complete topics starting with Age of American Expansion and ending with the Great Depression. The major area of focus during the senior year will be in the 20th century world history prescribed subject of Communism in Crisis and Topic 1 Causes, practices and effects of wars and Topic 5, The Cold War. This course fulfills the 20th Century Global Topics (Higher Level) as well as the regional option. A key area includes the IB Historical Investigation which is designed to teach students how to research and write a historical investigation. Students will be assessed in a variety of ways through the completion of projects, essays, objective and subjective tests including document based questions, and in class performance. Another component of assessment will be the externally moderated IB papers (Papers 1, 2 and 3) as well as the Internal Assessment. Note: IB Historical Investigation: All IB Seniors will complete a two year long research project focusing on key topics within the IB curriculum. The project will develop higher level research and writing.

IB 20th Century SL

11 Grade, Full Year

This is a one year course program.

The Diploma Programme (DP) History Course SL is a 20th Century World History Course based on a comparative, multi-perspective approach to history and focused around key historical concepts such as change, causation and significance. It involves the study of a variety of types of history, including political, economic, social, and cultural, encouraging students to think historically and to develop historical skills. In this way, the course involves a challenging and demanding critical exploration of the past. The course requires students to study and compare examples from different regions of the world, helping to foster international mindedness.

20th Century American History I

11 Grade, Full Year

Juniors not participating in the International Baccalaureate HL program will continue the rigorous course of study begun during Early America. Beginning with a focus on Reconstruction and continuing through the dawn of the 21st Century, students will further develop the critical thinking skills necessary to become adept at understanding the complexities of issues involved in the study of the social sciences. The students will build upon their solid knowledge of geography, understanding of political/economic systems and predominant issues of American history. They will further their research techniques and note taking skills and be able to formulate a thesis, construct an essay, and refine presentation skills to convey their ideas. Throughout the course the students will be assessed in a variety of ways through the completion of projects, essays, objective and subjective tests including document based questions, and in class performance. Note: All non-IB juniors will complete a yearlong research project

focusing on key topics within the junior curriculum. The project will be an opportunity for juniors to conduct college-level research on a topic of their choosing focusing on an aspect of American History. The paper requires a draft outline prior to final submission and a full annotated bibliography.

20th Century American History II

12 Grade, Full Year

This honors level course is a continuation of the Global History sequence. Beginning with a focus on post-Civil War Reconstruction and continuing through the Cold War, students will sharpen the critical thinking skills necessary to understand (and, in some cases, to attempt to solve) the complexities of both the historical and modern worlds. While the primary scope of this comprehensive course deals with the political, economic, and social history of the United States, it will often be taught through a global lens. Students will engage extensively with primary and secondary sources, and throughout the year, work towards becoming stronger thinkers, writers, and debaters. Prerequisite: 20th Century American History I.

World History I

9 Grade, Full Year

This course will provide you with a thorough understanding of world history, between the Postclassical Era and the revolutions in France, Latin America, and the United States in the early 1800s. You will develop a history-oriented vocabulary, an understanding of political, social and economic systems, and knowledge about the cultures, ideas, people and events that contributed to expanding globalization of the modern world. Throughout the course, you will have the opportunity to practice the skills historians use to examine a wide variety of evidence and construct multiple interpretations of the past. Specifically, you will consider different points of view, evaluate arguments proposed by historians, question primary and secondary sources, and develop your own conclusions. Historical context in the forms of maps, videos and readings will be integrated into the study of world history. This course will serve to prepare you for the IB history program at BCA during junior year. As society marches towards an ever increasingly globalized community, it becomes more imperative that we help students better understand the interconnected nature of history as a shared experience. In this curriculum, we hope to create a global approach to history and ridding the scope and sequence of excessive regional divisions traditionally found in World and American history programs.

World History II

10 Grade, Full Year

World History II is a core Social Studies course that strives to provide students with a broad reaching and conceptual understanding of history from a global perspective. To this end, politics, socio-economics, world religions and cultures are the lenses through which the students gain an understanding of world history. The course begins with the Rise of Europe in the age of the Renaissance and continues with such subjects as the Increase in Global Connections, Absolutism and the Origins of the Nation-State, the Enlightenment and the French and Haitian Revolutions that the Enlightenment gave rise to, the Industrial Revolution and Imperialism. While the course is a study of events and processes from the past, the intention of the instructors is to have students gain a solid and critical understanding of the world they live in currently and will be actively engaged in as adults. For this reason, in addition to Europe, attention is paid to the study of China and the Far East, India, the Islamic world, Latin America and Africa.

Trimester Long Electives

American History on Trial

9, 10, 11, 12 Grade, Trimester Long

In this course, students will have the opportunity to explore some of the more controversial actions and patterns of behavior of American presidents, starting with Thomas Jefferson. By crafting a trial case against Jefferson and others, students will investigate and impersonate key historical figures and build on their understanding of the

American judicial process. Students will also collaboratively design a trial packet on an American historical figure of their choice.

Contemporary Ethics

11 Grade, Trimester Long

Ethics is one of three main branches of philosophy and deals with what is right or wrong with human behavior – often referred to as morality. The other two branches of philosophy – epistemology (study of knowledge) and metaphysics (study of the nature of reality) – are connected to ethics and we will cover them as need be. This class will be a seminar format meaning that each class will be a discussion of the topic for the week. They will be reading to prepare for each class. Assessments include graded discussions as well as papers.

In the Era of Mao

9, 10, 11, 12 Grade, Trimester Long

Mao Zedong is both a product and cause of the political transformations that swept throughout China in the 20th century and is the individual most identified with the success and failures of the Communist Revolution. Through this elective, we will explore the complex dynamics of his personality and his continual reinterpretation of Chinese socialism. Through the exploration of primary and secondary sources, documentaries, and dramatic films, students will investigate the rise of Mao to power, the establishment of the People's Republic of China, The Great Leap Forward, the Great Proletarian Cultural Revolution, and contemporary China's understanding of the era of Mao.

Model UN

9, 10, 11, 12 Grade, Trimester Long

The goal of this course will be to instruct students in the current state of world affairs and how to argue and debate these issues using Model UN. Students will use web resources to research the United Nations and other international bodies, as well as international issues. They will use this information to debate international issues using standard Model UN debate format.

Modern Russian History I

10, 11, 12 Grade, Trimester Long

The Modern Russian History I course is the first of three electives that focus on the country's history from the mid-nineteenth through the early twenty-first century. Specifically, this course begins with the Crimean War (1853-1856) and ends with the Soviet Union on the eve of World War II (1941-1945). Some of the main themes that the elective will cover that are evident in the late imperial period include: war as a catalyst for political reform and revolution, Russia's relations with the West, the extent to which Russia's disastrous participation in World War I curtailed its move towards capitalism and parliamentary democracy, and the extent to which the Bolshevik Revolution in 1917 was 'inevitable.' After examining these themes, we will focus on the challenges that the new Soviet Government faced in attempting to build the first socialist country after the Red Army's victory in the Russian Civil War in 1921. In particular, this period will feature Lenin's New Economic Policy of the 1920's and will culminate with the emergence of Stalin and 'Stalinism' in the 1930's. The main goal of the elective is to shed light on one of the most important countries in the world over the last two centuries as one part of its history came to an end (the imperial period) and a new, much more controversial one began (the Soviet era). The course will mainly focus on Russia and will be taught including various perspectives. However, since the Russian Empire and the Soviet Union were both multi-ethnic and multi-confessional states, other groups that once belonged to those Russian-led states will also be included. Note: Juniors and Seniors in the IB history program are highly encouraged to take the elective since Russia / the Soviet Union is featured extensively in the IB History II – Twentieth Century Topics curriculum.

Modern Russian History II

10, 11, 12 Grade, Trimester Long

The Modern Russian History II elective covers the period of Soviet history from World War II until the collapse of the USSR in 1991. The course will begin with an examination of the significant Soviet contribution to the victory

over the fascist and militarist powers, the heavy toll that the country paid to secure that victory, and the impact of the war on the status of the Soviet Union globally. The bulk of this elective, however, will focus on the Cold War that emerged between the former wartime allies, the United States and the Soviet Union, at the end of World War II. We will examine the reasons for the emergence of the Cold War, how it impacted relations between the superpowers, and how the Cold War defined international relations throughout much of the world for the next half century. Finally, this elective will conclude with an examination of Soviet leader Mikhail Gorbachev's attempts to reform the Soviet system in the 1980's and the extent to which those reforms contributed to the collapse of the Soviet Union in 1991. Note: Seniors enrolled in the IB History program are particularly encouraged to take the elective since one of the subjects that the 20th Century Topics class covers is the Cold War. Prerequisite: Modern Russian History I, or teacher recommendation (seniors only).

Modern Russian History III

10, 11, 12 Grade, Trimester Long

The Post-Soviet Russia course is the final installment of the Modern Russian History electives offered at BCA. Normally it covers the period after the collapse of the Soviet Union in 1991 to the most recent developments impacting Russia and the fourteen other states that comprised the former USSR. However, for this Trimester 3, the chronology and curriculum will be altered to focus more details on the Cold War, the developments within the Soviet Union that led to Mikhail Gorbachev's perestroika, the collapse of the Soviet Union, and the challenges that Russia faced in creating a viable political and economic model in the 1990's. Juniors and seniors in the IB history program are encouraged to sign up as well. Prerequisite: Modern Russian History I & II or teacher recommendation.

Women in East Asia

9, 10, 11, 12 Grade, Trimester Long

Traditional historical narratives of women in pre-20th century East Asia often portray them as agentless actors, obscuring the diversity of female experience across time, place, and class. Through an investigation of primary and secondary sources, this elective will explore the concepts of femininity, feminism and filial piety within the context of China, Korea, and Japan to relocate the voice and critical roles women played.

Visual Arts

Core Courses

~Art Fundamentals

9,10,11,12 Grade, Semester Long

This course is a core requirement for the AVPA-V academy.

This course will cover the fundamentals in one the following areas in visual art: video, interactive design, fine arts, or computer imaging. It is possible that the teacher may be able to accommodate the more advanced student by differentiated instruction and assignments. For more information about what this section will cover or questions on if a more advanced student can enroll, please reach out to the teacher.

Design Prod 1

10 Grade, Semester Long

This course is a core requirement for the AVPA-V academy.

Students will be expected to push themselves in a number of visual art disciplines. The primary project for students is the C-SPAN StudentCam Competition. This is a five-month long unit that introduces students to the entire video production workflow. Students develop their documentary concept, prepare a treatment, research possible interview subjects, learn proper email etiquette to secure these interviews, create information graphics, find appropriate third-party video footage for their video, and learn how to edit all these assets into a final, complete 5-6 minute video segment. Other units include: an introduction to Arduino, a simple electronics platform that allows students to build simple circuits using basic programming skills; Virtual Animals, a unit that exposes students

to sculpting using virtual reality, which then leads to 3D printing of their sculpture; Cooper Hewitt National High School Design Competition, an annual contest that allows our students to apply their design skills to a real-world problem posed as part of the competition prompt. Students will use the skills they attain in Design Production 1 as they move through the rest of sophomore year and into junior year.

Design Prod 2

10 Grade, Semester Long

This course is a core requirement for the AVPA-V academy.

This program focuses on event management, planning, budgeting, and production. In accordance with the CTE CIP, the program prepares individuals to apply artistic and computer techniques to the interpretation of technical and commercial concepts. It includes instruction in computer-assisted art and design, color theory and psychology, imaging, communication skills, and commercial art business operations. At the end of the program, students will have experienced all of the components that go into a large-scale visual arts event.

Emerging Tech I

11 Grade, Semester Long

This course is a core requirement for the AVPA-V academy.

Multimedia is a theme used in many of the projects developed throughout this course. Advanced topics in web development will be examined, including animation, UX, UI patterns, responsive design, and a more in-depth look at CSS, JavaScript, and JQuery. Students will incorporate these concepts in web applications they develop. Students will be introduced to real-world situations and the applications used to create works that are aesthetic, practical and feasible for interaction or display, on screen or for print. Students will also learn the proper way to develop and prepare designs that they will cut and/or engrave on a laser cutting system. As with all of the visual arts courses, the topics covered mirror those covered in post-secondary institutions and are designed to prepare the student for success at that level and beyond.

Emerging Tech II

11 Grade, Semester Long

This course is a core requirement for the AVPA-V academy.

Students will develop skills in a variety of different areas through the following project-based units: Cooper Hewitt National High School Design Competition - This unit gives students the chance to exercise their design muscles through the development of their entry into this annual design competition; Shooting interviews for "The Romance Chronicles" - This unit allows students to put the video production knowledge they acquired in sophomore year to more creative use while at the same time helping to support one of the most popular video projects of the entire school year. Students will work in teams of four to five to accomplish this task; Technology Zoo - In this project, students will create an animal sculpture using recycled technology elements. Students disassemble equipment that no longer functions (either brought in from home or old district equipment that has been taken out of service) and use these components to create their animal. Students will learn to use basic hand tools for the disassembly of the recycled equipment. These include: screwdrivers (slotted and Phillips head), wrench, pliers, cutters, tin snips, and wire strippers. Students will pick an animal, find reference photos of this animal on the Internet, and then sketch a design for their animals after surveying the materials available to them. Students will then assemble the animal using a variety of tools and techniques. In addition to the basic tools mentioned above, these include epoxy, glue guns, and basic soldering. The completed animal must fit within a 1 foot cube and be capable of standing on its own with no other support. A number of documents, including a final set of presentation slides, will be produced throughout the project to document project progress; Movie Poster Trailer Production - Working from the movie posters they made as sophomores, students will create a short trailer for their movie. This unit will allow them to review the video production principles they learned during sophomore year while applying these skills in a fun and creative manner; Creating Animations in Virtual Reality - In this unit, students will work with an illustration program, Oculus Quill, that also features animation capabilities. Students will be introduced to the basic navigational and creation capabilities of the program and then use these tools to create "micro-animations." These

are very short 6 - 10 second animations that can be viewed from any angle with the virtual reality environment; "End of Spring Visual Academy Fling" Gallery Production - Students will help to design and assemble the gallery that is created to display their work during the last week of school.

Foundation of Visual Art

9 Grade, Semester Long

This course is a core requirement for the AVPA-V academy.

This course serves as the introductory foundation course for Visual Art majors. A main focus of this course is the concentration on the Elements and Principles of Art/Design and on bringing student drawing and design skills to a more mature level. Aside from the studio activities and specific design and intensive drawing skills taught in this course, students are required to maintain a sketchbook and a portfolio. Students are also introduced to the areas of aesthetics and critique enabling them to develop cognitive skills and a working vocabulary allowing them to analyze their art and the art of others.

Intro to Visual Art

9 Grade, Semester Long

This course is a core requirement for the AVPA-V academy.

Introduces students to visual arts and Graphic communications. Students are encouraged to create, design and explore utilizing a wide variety of media and printing processes to create images. Course content and projects include graphic design, computer instruction, and production. Units are divided into introduction to software usage, fundamental design elements and principle design, and perspective drawing, digital art and package design.

Visual Art Senior Capstone I

12 Grade, Semester Long

This course is a core requirement for the AVPA-V academy.

The goal of the course is to help students strengthen their art portfolios through the development of individual Capstone projects. Individual projects will be supplemented with classroom projects enhancing student's compositional, drawing, painting and sculpting skills. Throughout the course, AVPA-V seniors will be developing projects based on concepts and techniques they learned in the core courses in the previous three years, taking the concepts to a higher level. Their Capstone projects have the potential to be displayed in a public setting, and possibly even professionally published. Course content includes portfolio assessment, artwork display skills and development of communication and presentation skills.

Visual Art Senior Capstone II

12 Grade, Semester Long

This course is a core requirement for the AVPA-V academy.

This course will provide students to work in a graphic arts facility to acquire advanced skills in this area. Students focus on portfolio development and studio projects; personal and group. Students will be able to create their artwork in traditional media as well as in computer using Adobe Photoshop and Illustrator. Students will create their own books using Adobe InDesign. Course content includes portfolio assessment, competition artwork, electronic publishing, and presentation skills. I use lectures, visual learning aids, to present course materials.

Full Year Electives

AP Art History

11, 12 Grade, Full Year

An introductory college-level art history course. Students cultivate their understanding of art history through analyzing works of art and placing them in historical context as they explore concepts like culture and cultural

interactions, theories and interpretations of art, the impact of materials, processes, and techniques on art and art making, and understanding purpose and audience in art historical analysis.

AP Studio Art

11, 12 Grade, Full Year

For students who are interested in inquiry-based thinking and making. Prior experiences learning about and making art and design support students' success in AP Studio Art. Students create a portfolio of work to demonstrate inquiry through art and design and development of materials, processes, and ideas over the course of a year. Portfolios include works of art and design, process documentation, and written information about the work presented. In May, students submit portfolios for evaluation based on specific criteria, which include skillful synthesis of materials, processes, and ideas and sustained investigation through practice, experimentation, and revision, guided by question. Students need to put extra time into the completion of projects at home. At least five big scale art projects need to be produced during the first 2 trimesters. Preliminary Portfolio with at least 10 works in various art media. Students expected to execute the summer art assignment prior to the course. Participation in the Pre-AP Studio art course prior school year is a plus.

Drawing

10, 11, 12 Grade, Full Year

This full year twice a week "Drawing" course focuses on elements of art and principles of design fundamental applications in drawing: composition, proportion, spatial relationships, perspective, volume, light and shadow, value and texture. Students will explore both traditional and alternative media, drawing styles, techniques and materials. Students will be encouraged to develop observational sensibilities, build a unique visual perspective, improve their creative approach and critical judgment. This course is appropriate for both novice from any academy and 10th grade and up AVA students. Course doesn't have prerequisites, however students need to have a clear understanding that development/improvement of the art skills is time-consuming. Besides class time students are expected to put a minimum of additional 2-3 hours weekly into drawing exercises and projects. Note: This course satisfies the NJ State requirement for Visual and Performing Arts.

Design & Digital Media

10, 11, 12 Grade, Full Year

This course allows students to choose an independent project to work on while also being exposed to new hardware and software packages as a way of expanding their knowledge of the field of Digital Media. Students will have the chance to work in disciplines such as video production, virtual reality (VR), augmented reality (AR), 3D printing, laser cutting, Arduino, sculpture, animation, Unity game design, interactive installation, and Adobe packages such as Photoshop, Illustrator, and After Effects. Students will propose a plan for what they would like to study, what their end product(s) will be, and the timeline for getting this work accomplished. A final proposal will be created that will determine each students' learning path. Students must have taken a semester, full-year, or two trimester classes with Mr. Lang in order to sign up for this class.

~Pre AP Studio Art

10, 11, 12 Grade, Full Year

Designed for the students who would like to build up their art portfolio and consider AP Studio Art for the following year. It is a course of 2-D art and design and 3-D media exploration, and an opportunity to develop skill and technique in each. Students can bank works for their AP Studio Art portfolio and the college portfolio from this class. It is also a testing ground for non-visual majors to validate eligibility for the rigor and skill set required for AP Studio Art. Highly recommended for Visual majors. Class meets twice per week and students are expected to put 2-3 hours per week outside of class either at the class studio during frees or at home. Prerequisite: Foundations of Visual Art, or Art Fundamentals courses.

~Visual Art

10, 11, 12 Grade, Full Year

Non-AVPA students have a chance to experiment with various traditional and digital art techniques to create original works. The projects focus on two-dimensional works. However, if time permits, there may be a three-dimensional project as well.

Trimester Long Electives

~Ceramics

9, 10, 11, 12 Grade, Trimester Long

The introductory Ceramics course is open for all students to fulfill the HS art requirements. During this “hands on” course students will be exploring several aspects of working with clay. Students will be introduced to hand building techniques such as pinch pot, coil and slab. The fired ceramic objects will be glazed for a complete decorative look. By the end of the course students will have a better understanding of scale, fabrication techniques, and creative expression through three dimensional forms in space. The theme of the course projects varies each trimester.

~Creative Art Workshop

9, 10, 11, 12 Grade, Trimester Long

Students are offered the opportunity to explore creative expression through a variety of applied art options. Exploration of design concepts, aesthetics, technical skills and applications, and utilitarian function are infused in areas of study such as clay hand building, ceramic glazing, 3-D object design, paper design, to name a few. Workshops’ theme changes from trimester to trimester.

~Digital Imaging

9, 10, 11, 12 Grade, Trimester Long

This course is an introduction to creating images both for Web and Printing. During this trimester, students are going to create various digital images using Adobe Photoshop and Illustrator. They will also create the animated images using the animation window in Adobe Photoshop. Units are divided into introduction to software tools and terms, Photoshop projects, and Illustrator projects.

~Digital Photography

9, 10, 11, 12 Grade, Trimester Long

This Photography course is designed to teach the student how to use a camera and a little Adobe PhotoShop to capture, edit, manipulate and produce quality images for both print and the Internet/Multimedia. It is assumed that the student has little or no knowledge of photography. The course will help the student to become competent with a camera, both technically and composition-wise. The emphasis is on digital image capture and manipulation only; darkroom film processing is not covered. Assessments include quizzes and hands-on exercises/projects. The quizzes include a mix of true/false, multiple choice and short answer questions that cover theory and technical concepts. Exercises and projects use the cameras and image editing software to practice what was learned in theory and try different approaches to various problems.

~Global Art & Social Impact

9, 10, 11, 12 Grade, Trimester Long

Students will gain experience by analyzing, understanding, and enjoying various works of art and architecture. The main focus is on modern and post-modern contemporary art, with comparisons to other works throughout time. They will gain an understanding of the role that the arts play in reflecting man's thinking throughout history, how art and architecture is influenced by society, and vice versa. Students will build a vocabulary appropriate for describing and analyzing art. They will become familiar with the tools, techniques, and media used to produce the works, and in many cases, why those elements were used. Students will learn communication skills by actively participating in class discussions and delivering presentations. Students will also be able to develop their own artistic concepts through hands-on work.

~ Interactive Design

9, 10, 11, 12 Grade, Trimester Long

Level I: Students taking this course will work with the Arduino platform, program using Processing, and get an introduction to the Unity game engine. Interactive Design 1 is the foundation course for students who are interested in developing more in-depth, multi-trimester projects through courses such as Interactive Design 2 and 3, and Advanced Topics in Interactive Design 1, 2, and 3.

Level II: This course allows students to design their own project utilizing the skills they acquired in Interactive Design 1. Students will also have the chance to work with technologies such as virtual reality and 3D printing. Students in this class must have already taken Interactive Design 1.

Level III: This course allows students to continue work on projects they began in Interactive Design 2. They may also propose and develop new projects.

~Adv Top Interactive Design: For students who have completed the first three classes in the Interactive Design sequence, this course provides the opportunity to work on more advanced projects that combine multiple disciplines. Examples of previous projects include virtual reality experiences and interactive installations. Students in this class must have taken Interactive Design 1, 2, and 3.

~Adv Top Interactive Design II: This course is for those students continuing their work from Advanced Topics in Interactive Design 1. They may also propose and develop new projects. Examples of previous projects include virtual reality experiences and interactive installations. Students in this class must have taken Interactive Design 1, 2, and 3, and Advanced Topics in Interactive Design 1.

~Adv Top Interactive Design III: This course is for those students continuing their work from Advanced Topics in Interactive Design 2. They may also propose and develop new projects. Examples of previous projects include virtual reality experiences and interactive installations. Students in this class must have taken Interactive Design 1, 2, and 3, and Advanced Topics in Interactive Design 1 and 2.

~Intro to Photoshop

9, 10, 11, 12 Grade, Trimester Long

This is an introductory course that shows you how to edit and create amazing images and effects with PhotoShop. If you've never worked with PhotoShop before, no problem. The course will take you through step-by-step exercises using a range from beginner to some advanced level techniques. It will also help prepare students who are interested in taking the Adobe Certified Associate (ACA) exam, which covers entry-level knowledge of the software.

~Intro to UX Design

9, 10, 11, 12 Grade, Trimester Long

In this course, students learn the tools and techniques to design useful, functional, and pleasurable products. With an equal focus on theoretical frameworks and practical applications, students will progress through a final project of their choosing and receive feedback along the way. The project is designed to serve as an eventual portfolio piece, and will be worked through incrementally throughout the course.

~Paper Art

9, 10, 11, 12 Grade, Trimester Long

This course offers students various types of paper projects using different kinds of papers. The technique includes paper folding, pop-up, paper cutting, paper sculpture and collage. This is the course for anyone who is interested in working papers. Students can adapt in many ways to make simpler or more sophisticated artwork-using papers. Students are introduced to design concepts, aesthetics, function, technical skills and applications, and social, cultural, and historical influences on design.

~Video Prod

9, 10, 11, 12 Grade, Trimester Long

~Intro to Video Prod: Students will be introduced to the Video Production process, from Pre-Production to Production right through to Post-Production. Working with provided media on an initial project, they will learn the basics of non-linear editing using Adobe Premiere Pro. They will then work on a second project that will allow them to learn the basics of Pre-Production and Production as they utilize their editing skills to produce a finished video.

~Interm Video Prod: Students will have the opportunity to expand their Video Production skills through the production of a video project from scratch. This could be a video they propose or they could be school-related videos that are needed for promotional purposes, assemblies, special events, or posting to YouTube.

~Adv Video Prod: Students will continue to develop their Video Production skills through longer-form independent or school videos. Students in this class will also have the opportunity to work with Adobe After Effects to create advanced motion graphics / titles for their videos.

World Language

Core Courses

Espanol I-II Accelerated

9 Grade, Full Year

This course is designed for 9th graders who are studying the language for the first time or who have had some exposure to the language. An accelerated course meets more often than level II and it covers the essential grammar, vocabulary and cultural material of novice level. In this course, students will be introduced to the many countries in which the target language is spoken and will develop the basic skills necessary to communicate effectively in typical, everyday situations. Since the emphasis is placed on oral communication as well as writing and reading comprehension, the students will be engaged in activities involving the target language at all times; such as the creation and performance of original dialogues, question and answer scenarios, and various pair and group projects.

Espanol II

9 Grade, Full Year

The main goal of this course for 9th graders is to advance their communicative abilities to the novice-high level of proficiency in both written and oral form. In the first trimester, students discuss their summer vacations, current events, as well as their own recent experiences. In the second trimester, students learn to express completed past actions and write biographies of Spanish-speaking celebrities. Students also learn to describe places as they complete oral presentations about noteworthy places in Spanish speaking countries. During the third trimester, students analyze how times have changed from centuries ago to modern day. Students also discuss the importance of maintaining a healthy, active lifestyle while studying the parts of the body in Spanish. Prerequisite: Placement test.

Espanol III

10 Grade, Full Year

The course is for students in the 10th grade. The main goal is to advance a student's communicative abilities to the intermediate-mid level of proficiency in both written and oral form. In the first trimester, students learn to describe people, situations, and relationships. In the second trimester, students discuss the future of the environment and technology as well as consider what their own personal future may be like. During the third trimester, students read short stories and write anecdotes about their own lived experiences. Students also learn to form commands in order to give advice.

Francais I-II Accelerated

9 Grade, Full Year

This course is designed for freshmen who are studying French for the first time or who have had some exposure to the language but are not prepared for placement into level II. Français I-II covers the essential grammar, vocabulary and cultural material at the novice level. In this course, the students will be introduced to the many countries in which French is spoken and will develop the basic skills necessary to communicate effectively in typical, everyday situations. Since the emphasis is placed on oral communication as well as writing and reading comprehension, the students will be engaged in activities involving the target language at all times. Typical activities include: the creation and performance of original dialogs and skits, question and answer scenarios, and various pair and group projects.

Francais II

9 Grade, Full Year

The main goal of this course is to advance the student's communicative abilities to the novice-high level of proficiency. Through a variety of oral and written activities, the students develop their French using interpretive, interpersonal and presentational modes of communication. Typical topics include: describing oneself and others, daily life, and marketplace and restaurant interactions. Prerequisite: Placement Test.

Francais III

10 Grade, Full Year

The main goal of this course is to advance the student's communicative abilities to the intermediate-mid level of proficiency through a variety of interpretive, interpersonal and presentational activities in both written and oral form. Typical themes include leisure activities, summer vacation, how life used to be, and social conflict. During the third trimester, students read short, authentic literary works and write about their own lived experiences.

IB Espanol IV HL

11 Grade, Full Year

This is a two year course sequence in 11th and 12th grade.

At Spanish IV – V HL level, students are expected to make use of the range and complexity of the language they use and understand in order to communicate. They continue to develop their knowledge of vocabulary and grammar, as well as their conceptual understanding of how the language works, in order to construct, analyze and evaluate arguments on a variety of different topics relating to course content and the target language culture(s). Students summarize chapter books and use a variety of strategies to maintain the flow of conversations and discussions with the purpose of making connections to the IB topics, as well as the cultural aspect of the written and spoken authentic materials.

IB Espanol IV SL

11 Grade, Full Year

This is a two year course sequence in 11th and 12th grade.

In Spanish B Standard Level IV, students further develop their ability to communicate in the Spanish language through the study of language, themes, and texts at the intermediate-high skill level. IB Language acquisition courses develop language skills and “foster intercultural understanding and global engagement, encouraging students to make non-judgmental comparisons of language and culture and to view both in a global context.” In the fall, students will review the grammar of previous years and learn to express desires, doubts, the unknown, the abstract, and emotions while talking about diversity and wellbeing; in the winter students will work on narration of the past and the expression of possibilities while exploring traditions and expressions of love and, finally in the spring, students will work on different expressions of time including the future in the context of social changes and social harmony. Prerequisite: Prerequisite Espanol III.

IB Espanol V HL

12 Grade, Full Year

This is a two year course sequence in 11th and 12th grade.

At Spanish IV – V HL level, students are expected to make use of the range and complexity of the language they use and understand in order to communicate. They continue to develop their knowledge of vocabulary and grammar, as well as their conceptual understanding of how the language works, in order to construct, analyze and evaluate arguments on a variety of different topics relating to course content and the target language culture(s). Students summarize chapter books and use a variety of strategies to maintain the flow of conversations and discussions with the purpose of making connections to the IB topics, as well as the cultural aspect of the written and spoken authentic materials. Prerequisite Espanol IV HL.

IB Espanol V SL

12 Grade, Full Year

This is a two year course sequence in 11th and 12th grade.

In Spanish B Standard Level V, students further develop their ability to communicate in the Spanish language through the study of language, themes, and texts at the intermediate-advanced skill level. IB language acquisition courses develop language skills and “foster intercultural understanding and global engagement, encouraging students to make non-judgmental comparisons of language and culture and to view both in a global context. The IB themes provide relevant contexts for study at all levels of language acquisition in the DP, and opportunities for students to communicate about matters of personal, local or national, and global interest: In the fall, students explore Identities, Experiences, and how we Share the Planet while describing, narrating, and expressing doubts and desires; in the winter students talk about current events and make predictions related to the Human Ingenuity and Social Organization, and, finally, in the spring, students review and prepare to take the IB exams. Prerequisite Espanol IV SL.

IB Francais IV HL

11 Grade, Full Year

This is a two year course sequence in 11th and 12th grade.

The 2-year International Baccalaureate program aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect. In Français V IB HL, students are expected to extend the range and complexity of the language they use and understand in order to communicate at an advanced level. A major point of emphasis is the ability to analyze and develop arguments on a wide variety of topics, both orally and in writing. The students read a variety of authentic articles and literary works in the light of the five IB themes: identities, experiences, human ingenuity, social organization and the sharing of the planet. During the third trimester, the students begin reading and analyzing their first full-length book in French, "Le Petit Prince" by Antoine de Saint-Exupéry.

IB Francais IV SL

11 Grade, Full Year

This is a two year course sequence in 11th and 12th grade.

The focus of the French B Standard Level IV course is language acquisition at the intermediate-high linguistic level. This course aims to foster an appreciation and understanding of French and Francophone cultures through the study of language, culture, and culturally-authentic materials. Students are given the opportunity to reach a high degree of competence in French, as well as to explore French cultures throughout the world. The course's curriculum covers five thematic units: Identities, Experiences, Human Ingenuity, Social Organization, and Sharing the Planet. The course will include collaborative learning opportunities, communicative activities, oral presentations, listening activities, cultural readings in the target language, connections to other disciplines.

IB Francais V HL

12 Grade, Full Year

This is a two year course sequence in 11th and 12th grade.

The 2-year International Baccalaureate program aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect. In Français V IB HL, students are expected to extend the range and complexity of the language they use and understand in order to communicate at an advanced level. A major point of emphasis is the ability to analyze and develop arguments on a wide variety of topics, both orally and in writing. The students read a variety of authentic articles and literary works in the light of the five IB themes: identities, experiences, human ingenuity, social organization and the sharing of the planet. The students extend the literary exploration they began with "Le Petit Prince" by delving into a second full-length work, typically "Antigone" by Jean Anouilh.

IB Francais V SL

12 Grade, Full Year

This is a two year course sequence in 11th and 12th grade.

The focus of the French B Standard Level IV course is language acquisition at the intermediate-high linguistic level. This course aims to foster an appreciation and understanding of French and Francophone cultures through the study of language, culture, and culturally-authentic materials. Students are given the opportunity to reach a high degree of competence in French, as well as to explore French cultures throughout the world. The course's curriculum covers five thematic units: Identities, Experiences, Human Ingenuity, Social Organization, and Sharing the Planet. The course will include collaborative learning opportunities, communicative activities, oral presentations, listening activities, cultural readings in the target language, connections to other disciplines. The IBO states that the "...Language B course should be a challenging educational experience for the student, offering not only the opportunity to learn an additional language, but also the means of learning, appreciating and effectively interacting in a culture different from the student's own." Integral assessments for this course include the Internal Oral Assessment, as well as the externally moderated IB papers.

IB Mandarin IV Ab Initio (SL)

11 Grade, Full Year

This is a two year course sequence in 11th and 12th grade.

In the IB Mandarin IV ab initio course, students reinforce the knowledge of vocabulary and grammar—the what of language— and extend it by understanding the why and how of language: audience, context, purpose, meaning. Students expand the range of their communication skills by understanding and producing a wide variety of oral and written texts for audiences, contexts and purposes associated with academic and personal interests.

IB Mandarin V Ab Initio (SL)

12 Grade, Full Year

This is a two year course sequence in 11th and 12th grade.

In the IB Mandarin V ab initio course, students develop the ability to communicate in the target language through the study of language, themes, and texts. In doing so, they also develop conceptual understandings of how

language works. Communication is evidenced through receptive, productive, and interactive skills across a range of contexts and purposes that are appropriate to the level of the course. The study of Mandarin Chinese requires careful attention to forms, structures, functions, and conceptual understandings of language.

Mandarin I-II Accelerated

9 Grade, Full Year

Mandarin I-II is designed for 9th graders who are studying Mandarin for the first time or who have had limited exposure to Mandarin. Mandarin I-II is an accelerated course which meets more often than Mandarin II and covers more material. Mandarin I-II covers the essential grammar, vocabulary, and cultural material of the novice level. In this course students will learn to introduce themselves and their family, ask and answer simple questions, express their preferences, and schedule simple events. At the end of the course students will be able to read and write around 200 basic characters.

Mandarin II

9 Grade, Full Year

In this course, students will develop their Mandarin Chinese language skills to make basic conversations on topics such as routines and daily life, rooms and furniture, clothing, food and health, weather, and entertainment. By the end of the course students should be able to express personal meaning in a basic way, and successfully handle several uncomplicated communicative tasks and topics necessary for survival in the target-languages culture. The goal of this course is to help students reach a proficiency level of Novice Mid or Novice High according to ACTFL guidelines.

Mandarin III

10 Grade, Full Year

The main goal of this course is to advance the student's communicative abilities to the intermediate-low level of proficiency through a variety of interpretive, interpersonal and presentational activities in both written and oral form. We will cover topics such as: clothing, weather, and transportation. By the end of the course, students should be able to understand simple conversations and descriptions closely related to personal experiences or everyday life, exchange ideas with others on familiar topics, and give descriptions in simple language. They will be able to recognize 700-1000 characters, read simple texts, and comprehend written texts on familiar topics.

Trimester Long Electives

~Contemporary Caribbean Art

9, 10, 11, 12 Grade, Trimester Long

This course is designed to introduce students to recognize Latino artists from Mexico and the Caribbean. Students will discover the works of artists such as Cundo Bermúdez, Wifredo Lam, David Alfaro Siqueiros, Frida Kahlo, José Clemente Orozco, Jean-Michel Basquiat and more. Students will explore their lives and times and come to understand how these artists have expressed the influences of pop culture, religion, politics, human suffering and pain in their creations-- an elective designed to appeal not only to the artistically inclined but also to historians and enthusiasts of mankind's achievements.

~Intro to Latin Music

9, 10, 11, 12 Grade, Trimester Long

Introduction to Latin Music elective serves as a gateway for students who love music and are curious about the Spanish speaking world. In this course students will learn about the history of music in different Spanish speaking countries. Students will be exposed to authentic Latin music, the sounds as well as the cultural impact on people and around the world. This course will offer an introduction to the variety of Latin music genres, musical

instruments commonly used and the famous songwriters and singers that have left a mark in Latin music throughout our history and incorporate dance.

Intro to ASL

9, 10, 11, 12 Grade, Trimester Long

Section A (I/II/III/IV): This class will introduce basic American Sign Language using the web-based course Lifepoint. Students will practice language through interviews, skits and presentations. All levels are welcome. ASL A will cover lessons 1 and 2 – talking about self and family. This class does not count towards your GPA.

Section B (I/II/III/IV): This class will introduce basic American Sign Language using the web-based course Lifepoint. Students will practice language through interviews, skits and presentations. ASL B will cover School, home, city, and interpersonal conflicts. This class does not count towards your GPA.

Section C (I/II/III/IV): This class will introduce basic American Sign Language using the web-based course Lifepoint. Students will practice language through interviews, skits and presentations. All levels are welcome. ASL C will cover transportation, media colors, and time. This class does not count towards your GPA.

Section D (I/II/III/IV): This class will introduce basic American Sign Language using the web-based course Lifepoint. Students will practice language through interviews, skits and presentations. All levels are welcome. ASL D will cover food, clothes, and household life. This class does not count towards your GPA.

~Spanish Customs & Traditions

9, 10, 11, 12 Grade, Trimester Long

What are the customs and traditions of the Spanish-speaking world? How did they come about? Latin America is full of rich traditions, festive holidays, and tantalizing superstitions. In this elective students will learn and understand more of the European and Indigenous customs and traditions that fused to create Latin American culture. Students will also learn about the influence from traditions brought by Africans to the continent during colonial times.

Veganism

9, 10, 11, 12 Grade, Trimester Long

In this course, students explore how the practice of veganism intersects with topics such as animal rights, environmentalism, health, culinary arts, social justice, feminism, psychology, and mindfulness. You do NOT need to be vegan/vegetarian to enroll! All are welcome!

~Vibrant Flavors of the Latin Cuisine

9, 10, 11, 12 Grade, Trimester Long

If your experience of Latin Cuisine gets reduced to “empanadas”, you need to learn more about it! During our Vibrant Flavors of the Latin Cuisine, we will research (and sample) the gastronomy in Latin America, its ingredients, history, fun facts, and some Spanish lingo that will help you survive while ordering your next plate: “Qué aproveche”!

~Vibrant Flavors of the Spanish Cuisine

9, 10, 11, 12 Grade, Trimester Long

If your experience of food from Spain gets reduced to “paella” and you order it as a dinner (a big no-no in Spain) then you need to learn more about it! During our Vibrant Flavors of Spanish Cuisine, we will research (and sample) the gastronomy in Spain, its ingredients, history, fun facts, and some Spanish lingo that will help you survive while ordering your next plate: “Qué aproveche”!