

ACADEMY FOR INFORMATION TECHNOLOGY



ACADEMIC PROGRAM GUIDE 2024-2025

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SCHEDULING

Students will complete a course registration form which must be submitted by the announced due date. Students and parents should carefully read over all course descriptions and pre-requisites before selecting classes. Students will only be allowed to request courses for which they meet the pre-requisite requirements.

Every attempt will be made to honor a student's course requests; however, conflicts may occur due to scheduling constraints, in which case, students will be enrolled in the courses selected as alternates. Therefore, alternate choices should be selected carefully when planning a schedule of courses and ranked in order of preference.

ELECTIVE COURSE SCHEDULING

Classes that do not fulfill a specific graduation requirement are considered elective courses. Students may choose elective courses from either of the following categories:

1. Core Content Courses
 - a. Career and Technical Education (CTE), English, Social Studies, Mathematics, Science, World Language
2. Career and Technical Courses at another UCVTS School*

*Scheduling priority is given to students in the school where the CTE course is offered. Students wishing to enroll in a CTE course outside of AIT may do so only if space permits and the course is educationally beneficial to the student. CTE courses in other UCVTS schools are available to AIT students on a limited basis. Please keep this in mind when making elective and alternate choices.

SCHEDULING PRIORITY

Scheduling priority for all career and technical courses is given based on CTE school relative to the course and then seniority. Students will be scheduled as follows: senior CTE relative to the course, junior CTE relative to the course, sophomore CTE relative to the course, other seniors, other juniors, other sophomores.

Scheduling priority for all other courses, including core-content courses, is given based on seniority. Students will be scheduled as follows: all seniors, all juniors, all sophomores, all freshmen.

Scheduling priority applies only to the development of initial schedules. Once schedules are distributed to students, schedule changes will be made as space permits without regard to priority.

SCHEDULE CHANGES

Schedule changes will **not** be made for reasons of convenience or because of teacher preference. Only changes which are educationally beneficial to the student will be considered.

Scheduling changes will **not** be considered for any of the following reasons:

1. Course content or standards differing from student expectations.
2. Inability of a student to relate well to a given teacher.
3. Dropping a course in order to lighten one's load.
4. Participation in extra-curricular activities and/or athletics.

DROP/ADD PERIOD

Students have two weeks from the start of a semester to request a schedule change. All requests must be made in writing to the student's school counselor and will only be made if the change is educationally beneficial to the student.

ADVANCED PLACEMENT (AP) COURSE REQUIREMENTS

Advanced Placement (AP) courses are college-level courses that give students the opportunity to earn college credit or placement while still in high school. Due to the academic rigor of these courses, students and parents/guardians **must** read and sign a contract outlining course policies and expectations.

All AP courses are designed for those wishing to work diligently in order to prepare for the AP Exam administered by the College Board in May.

GRADING POLICY

Grades may be interpreted as follows:

A	90-100
B	80-89
C	70-79
D	65-69
F	64 or below

For full year courses, each marking period grade counts for 20% of the student's final course grade. Midterm and final examinations each count for 10% of the final course grade.

For semester courses, each marking period grade counts for 40% of the student's final course grade. The final semester examination counts for 20% of the final course grade.

QUALITY POINT AVERAGE

A Quality Point Average (QPA) will be calculated for each student. The final course grade is multiplied by the number of credits received for the course. The total credits and the total quality points are then divided to produce the QPA as in the example below:

Subject	Grade	Credits	Quality Points
Career and Technical	95	5	475
English	90	5	450
Social Studies	94	5	470
Math	87	5	435
Science	90	6	540
World Language	90	5	450
Fitness	98	3.75	367.5
Health	99	1.25	123.75
Total		36	3311.25

$$3311.25 / 36 = 91.9792$$

QPA is calculated for transcripts only when a course has been completed.

The QPA appearing on the high school transcript is **unweighted** and includes all subjects with the exception of repeated coursework. An official QPA can be obtained from the student's school counselor and can be found in Naviance Student. For more details, please see the Student Handbook.

FAILURES

Students that fail a course required for graduation must attend summer school and successfully complete the course before the next course in that subject area's sequence can be taken. It is the student's responsibility to find and enroll in an approved equivalent of the failed course. The transcript will show the student's failing grade in the course, which will be included in the QPA. The transcript will also show that the student repeated

the class and the grade and credit that was earned. Grades earned in repeated coursework are not included in the QPA.

ACADEMIC PROBATION

Students whose work falls below acceptable standards of achievement (70%) may be placed on academic probation. Conference with school administrator, counselor, parent, and student may be required to review academic expectations. Options to help student, such as peer tutoring, individualized instructional plans, or extra assistance from faculty may be implemented. School administrator may take additional action, including limiting student's co-curricular options and extra-curricular activity participation.

GRADUATION REQUIREMENTS

Students must earn 120 credits to graduate with a high school diploma endorsed by the New Jersey Department of Education. The **required** coursework for Academy for Information Technology is as follows:

Subject Area	Freshmen Year	Sophomore Year	Junior Year	Senior Year
Career and Technical Education <i>4 years</i>	Computer Applications in Business	AP Computer Science Principles and Principles of Business and Principles of Finance	<i>BIG Opportunities:</i> AP Economics Macro/Micro <i>Computer Science:</i> AP Computer Science A	<i>BIG Opportunities:</i> Global Financial Markets & Investments <i>Computer Science:</i> Advanced Software Development
English <i>4 years</i>	World Literature	Early American Literature	Modern American Literature	Additional English Course
Social Studies <i>3 years</i>	World History	United States History I	United States History II	
Mathematics* <i>4 years</i>	Combined Algebra	Geometry/Trigonometry	Math Analysis	<i>BIG Opportunities:</i> Business Intelligence & Analytics <i>Computer Science:</i> Next in sequence Math course <i>or</i> Additional Math Course
Science <i>4 years</i>	Biology and Scientific Inquiry & Analysis	Chemistry	Physics	Additional Science Course
World Language* <i>3 years</i>	Spanish I	Spanish II	Spanish III	
Fitness/Health <i>4 years</i>	Fitness I & Health I	Fitness II & Health II	Fitness III & Health III	Fitness IV & Health IV
Visual and Performing Arts <i>1 year</i>		Dance Appreciation		

*Initial placement determined by UCPTS.

AWARDS AND HONORS

Honor Roll: Awarded each Marking Period to students earning an 80 or above in all subjects.

High Honor Roll: Awarded each Marking Period to students earning a 90 or above in all subjects.

National Honor Society: Open to junior and senior students who meet Society's standards for academics, character, leadership, and service. Students must have a QPA of 92 or above in order to be considered.

Spanish Honor Society: Open to junior and senior students earning a 92 or above in Spanish, and an overall QPA of 85 or above. Students must meet the Society's standards for academics, character, leadership, service.

CAREER AND TECHNICAL EDUCATION

* Courses marked with an asterisk may be available to students from other UCVTS schools based on availability. Academy for Information Technology students are given priority enrollment in these courses.

In addition to the coursework listed below, AIT students are expected to maintain an individual Digital Portfolio. First created in Computer Application in Business, the Digital Portfolio is a celebration of the personal growth and achievement students experience throughout the four year journey at the Academy for Information Technology through scholarship and service to others. The Digital Portfolio also serves to celebrate the authentic learning and industry certifications that characterize career and technical education at AIT. Presentation of the Digital Portfolio is a requirement for all graduating seniors.

Course Title: [Computer Applications in Business](#)

Course Number: 01_1001_030

Grade Level: 9

Credits: 5

Computer Applications in Business offers a multidisciplinary approach to teaching the underlying principles of the data and information of business and technology. The course will introduce students to large data sets, the Internet, and the applications that drive business. The IC3 Global Standard certification is aligned to the most current and relevant digital literacy requirements, and addresses several new concepts common to digital literacy, such as social media, collaboration, digital devices, research fluency, critical thinking, and cloud computing.

Course Title: AP Computer Science Principles

Course Number: 01_2101_030

Grade Level: 10

Credits: 5

Pre-Requisite: Successful completion of Computer Applications in Business

AP Computer Science Principles offers a multidisciplinary approach to teaching the underlying principles of computation. The course will introduce students to the creative aspects of programming, abstractions, algorithms, large data sets, the Internet, cybersecurity concerns, and computing impacts. Students in this course have the opportunity to use technology to address real-world problems and build relevant solutions through an understanding of the most common hardware and software technologies in business and certifies the skills necessary to support complex IT infrastructures. The course will prepare students for the IT Fundamentals+ Certification.

Course Title: [Principles of Business](#)

Course Number: 01_2201_030

Grade Level: 10

Credits: 2.5

Pre-Requisite: Successful completion of Computer Applications in Business

Co-Requisite: Course Sequenced with Principles of Finance

Course Title: [Principles of Finance](#)

Course Number: 01_2202_030

Grade Level: 10

Credits: 2.5

Pre-Requisite: Successful completion of Computer Applications in Business

Co-Requisite: Course Sequenced with Principles of Business

This full year course is designed to introduce students to the basic economic and financial literacy principles as well as to expose them to the major functions they will encounter in any enterprise. Owning and operating your own business can be exhilarating and challenging. Often, there is more than one “correct answer” to resolving issues and business people constantly have to make decisions with incomplete information. Decisions may not necessarily be wrong, however, one outcome may be better than another. This class will provide students with the exposure to make business decisions without the real risk of personal financial loss. Students will have an online summer learning requirement.

Course Title: [AP Capstone: Seminar](#)

Course Number: 01_3001_030

Grade Level: 11

Credits: 5

Pre-Requisite: Must have recommendation of Early American Literature teacher

Required two-year commitment with senior year enrollment in AP Capstone: Research

AP Capstone is an innovative program that equips students with the independent research, collaborative teamwork, and communication skills that are increasingly valued by colleges. The AP Capstone courses are designed to complement and enhance the in-depth, discipline-specific study provided through other AP courses. The AP Capstone curriculum fosters inquiry, research, collaboration, and writing skills through the intensive investigation of topics from multiple perspectives. AP Capstone: Seminar provides sustained practice of investigating issues from multiple perspectives and cultivates student writing abilities so they can craft, communicate, and defend evidence-based arguments. Students are empowered to collect and analyze information with accuracy and precision and are assessed through a team project and presentation, an individual written essay and presentation, and a written exam.

Course Title: [AP Economics \(Macro/Micro\)](#)

Course Number: 01_3201_030

Grade Level: 11

Credits: 5

Pre-Requisite: Successful completion of Principles of Business and Principles of Finance

This full year course covers both Macroeconomics and Microeconomics. Macroeconomics is the study of the economy in the aggregate so it focuses on how consumers and businesses respond to changes collectively. Microeconomics is the study of economic behavior for individuals and individual businesses. It is a challenging, rigorous, and fast paced course. This class is both conceptual and quantitative. Most concepts are covered both numerically and graphically. Students who take this class are expected to be self-directed learners who have an interest in the economy, or plan to pursue a business oriented program in college. Students will be expected to complete the readings and problems assigned as well as supplement their understanding of the material with outside sources. This course is restricted to Business pathway students as it incorporates career and technical education major specific coursework.

Course Title: AP Computer Science A

Course Number: 01_4101_030

Grade Level: 11

Credits: 5

Pre-Requisite: Successful completion of AP Computer Science Principles

Course is available only to students on the Computer Science pathway.

This course introduces students to computer science with fundamental topics that include problem solving, design strategies and methodologies, organization of data (data structures), approaches to processing data (algorithms), analysis of potential solutions, and the ethical and social implications of computing. The course emphasizes both object-oriented and imperative problem solving and design using Java language. These techniques represent proven approaches for developing solutions that can scale up from small, simple problems to large, complex problems. The AP Computer Science A course curriculum is compatible with many CS1 courses in colleges and universities.

Course Title: [Global Financial Markets and Investment](#)

Course Number: 01_4201_030

Grade Level: 12

Credits: 5

Pre-Requisite: Successful completion of AP Economics (Macro/Micro)

Course is available only to students on the BIG Opportunities pathway.

This course provides students the opportunity to build upon the concepts of both AP Macro and Micro Economics through meaningful insight into the world of investment. By exploring the principles of various financial markets and analyzing financial statement and reports, student will learn the strategies and challenges of investing in securities and complex financial instruments. Students will also review the changing roles of financial institutions and the impact of regulations on finance. Emphasis will be placed on incorporating

current events and case studies into class discussions and assignments. Students will use competitive market simulations and Bloomberg resources to gain a better understanding of stock analysis and portfolio management.

Course Title: Database Development & Programming

Course Number: 01_3101_030

Grade Level: 11-12

Credits: 5

Course is available only to students on the Computer Science pathway.

This course introduces students to basic relational database concepts. The course teaches students relational database terminology, as well as data modeling concepts, building Entity Relationship Diagrams (ERDs), and mapping ERDs. Oracle SQL Developer Data Modeler is utilized to build ERDs and the Structured Query Language (SQL) is used to interact with a relational database and manipulate data within the database. Oracle Application Express is used to provide practical, hands-on, engaging activities. Leveraging project-based learning techniques, students will create and work with project which challenge them to design, implement, and demonstrate a database solution for a business or organization.

Course Title: Advanced Software Development

Course Number: 01_5106_030

Grade Level: 12

Credits: 5

Pre-Requisite: Successful completion of AP Computer Science A

Course is available only to students on the Computer Science pathway.

Advanced Software Development is a project-based seminar that allows students to connect the dots of each of the computer science and programming courses available at AIT. Students are expected to develop, debug, optimize, and maintain multi-tier distributed systems. Coursework is entirely hands-on, and goes well beyond programming and language fundamentals. Projects entail requirements analysis, architectural decisions, and UI/UX design, as well as application development, quality assurance, and integration testing. Prior experience in object-oriented programming, client-side scripting languages, relational and NoSQL database technologies, and version control systems is required. A basic understanding of Unix-like operating systems and CLIs is recommended.

Course Title: [AP Capstone: Research](#)

Course Number: 01_4001_030

Grade Level: 12

Credits: 5

Pre-Requisite: Successful completion of AP Capstone: Seminar

Core Requirement: This course may be used to satisfy the UCVTS fourth year English requirement.

AP Research allows students to deeply explore an academic topic, problem, or issue of individual interest. Through this exploration, students design, plan, and conduct a year-long research based investigation to address a research question. In the AP Research course, students further their skills acquired in the AP Seminar course by understanding research methodology; employing ethical research practices; and accessing, analyzing, and synthesizing information as they address a research question. Students explore their skill development, document their processes, and curate the artifacts of the development of their scholarly work in a portfolio. The course culminates in an academic paper of approximately 4000–5000 words (accompanied by a performance or exhibition of product where applicable) and a presentation with an oral defense.

Course Title: [Computer Art*](#)

Course Number: 01_5002_030

Grade Level: 11, 12

Credits: 5

This full-year studio course will begin by introducing the principles of design problem-solving, including practical applications in identity, information, promotion, and advertising. Issues of visual form, the design process, client and market requirements, research, and personal expression are addressed. As the course continues, students will continue to explore graphics software in the Adobe Creative Suite. Studio projects in digital drawing, typography, and image editing explore design elements and principles.

Course Title: [Web Design](#)*

Grade Level: 12

Course Number: 01_5101_030

Credits: 5

This course will focus on web page planning, basic design, layout, and construction (effective and ineffective), setup and maintenance of a web site, HTML, DHTML, JavaScript, and various web page and image creation tools. Students will learn the basics of web design principles, digital media options, web design language, Internet uses and processes, design considerations, the impact of target market demographics, deliverables, and multiple software packages. The course will introduce students to the integration of various media into programming assignments including web assignments.

Course Title: [Data Integrity/Security](#)*

Grade Level: 11, 12

Course Number: 01_5102_030

Credits: 2.5

The Data Integrity course focuses on communication security in computer systems and networks. The course is intended to provide students with a comprehensive introduction to the field of network security. The course covers critical network security services such as authentication and access control, integrity and confidentiality of data, routing, firewalls, virtual private networks, and web security. Where appropriate, threats and vulnerabilities to specific architectures and protocols will be examined.

Course Title: Senior Internship – Information Technology

Grade Level: 12

Course Number: 01_5103_030

Credits: 5 or 10

Pre-Requisite: Student must secure internship at new or existing partner site by September 1 or December 1. Student must have transportation to the internship.

The senior experience establishes liaisons to provide valuable learning opportunities and bridge the world beyond the campus. Mentorship opportunities will further educational pursuits in the Information Technology field. There will be both a full-year and half-year option for students who wish to participate in this out-of-school work experience. The internship will provide the opportunity for the student to experience “work-based learning” by placing them in an Information Technology career setting at local facilities. The internship is unpaid.

Placement locations should be identified by the student with assistance of the SLE coordinator. Placements must be found before December 1.

Course Title: [IT History](#)*/**

Grade Level: 11, 12

Course Number: 01_5107_030

Credits: 2.5

The history of IT has evolved parallel to human achievement. The importance of learning about the rich history of IT is vital in the frenetic world of information, which today changes at lightning speed. This class allows students to better understand the roots, past, history, and future of this discipline so vital in today’s society and work world. The course includes scholarly examination using academic research techniques that delve into all five historic areas of IT, kinesthetic examination of pre-mechanical, mechanical, electro-mechanical, and electronic artifacts, student projects and presentations on key events, figures, and breakthroughs in IT, and evaluation of the Age of Information through the historic, ethical, philosophical and futuristic lens. The IT History course will be tasked with the development and maintenance of the AIT IT Museum.

***This course is offered in conjunction with The School of Design. AIT and SOD students are given priority enrollment in this course.*

Course Title: [Project Management](#)*

Grade Level: 11, 12

Course Number: 01_5207_030

Credits: 5

Project management is one of the business world's most in-demand skill sets, both inside and outside the IT profession. Even the smallest projects can benefit from project management processes. Well-run projects save time and ensure continued focus on company goals. The CompTIA Project+ certification validates the communication and business skills you need to lead projects with confidence, complete projects on time and make sure you stay within budget. CompTIA Project+ certifies the knowledge and skills of professionals in project management. Project+ validates the ability to initiate, manage and support a project or business initiative. And it's not just for IT technicians; Project+ is designed for any individual who wants to validate project management experience.

***This course is offered in support of the UCVTS Chapter of FBLA. Scheduling preference will be given to AIT students and then FBLA members.*

Course Title: [Senior Internship - Business](#)

Grade Level: 12

Course Number: 01_5202_030

Credits: 5 or 10

Pre-Requisite: Student must secure internship at new or existing partner site by September 1 or December 1. Student must have transportation to the internship.

The senior experience establishes liaisons to provide valuable learning opportunities and bridge the world beyond the campus. Mentorship opportunities will further educational pursuits in the Business field. There will be both a full-year and half-year option for students who wish to participate in this out-of-school work experience. The internship will provide the opportunity for the student to experience "work-based learning" by placing them in a Business career setting at local facilities. The internship is unpaid.

Placement locations should be identified by the student with assistance of the SLE coordinator. Placements must be found before December 1.

Course Title: [Accounting](#)*

Grade Level: 11, 12

Course Number: 01_5205_030

Credits: 5

The course will introduce students to the basic principles, concepts, and procedures of accounting. Emphasis is placed on the accounting cycle, from analyzing and recording transactions to preparing financial statements. An automated accounting computerized instructional program will be utilized to help students make the transition from manual to computer-based accounting. Business ethics will be covered to focus students' attention on ethical issues in accounting and in the business environment. The goal of this course is to develop an understanding of the accounting skills needed in the financial management of goods and service businesses organized as sole proprietorships and partnerships as well as preparation for accounting or finance in college or as a career.

Course Title: Marketing Concepts and Case Studies*

Grade Level: 11, 12

Course Number: TBD

Credits: 5

The course will provide students with the knowledge and skills to answer questions such as: What are the components of an effective marketing plan and how is their success measured? How do economic conditions impact marketing strategy? How can marketing be used to advance business goals and solve business problems? How can marketing be used to reach underserved demographics?

Course Title: [AP Economics \(Macro/Micro\)](#)*

Grade Level: 11, 12

Course Number: 01_5206_030

Credits: 5

Pre-Requisite: 85 or higher recommended in Combined Algebra

This full year course covers both Macroeconomics and Microeconomics. Macroeconomics is the study of the economy in the aggregate so it focuses on how consumers and businesses respond to changes collectively. Microeconomics is the study of economic behavior for individuals and individual businesses. It is a challenging, rigorous, and fast paced course. This class is both conceptual and quantitative. Most concepts are covered both numerically and graphically. Students who take this class are expected to be self-directed learners who have an interest in the economy, or plan to pursue a business oriented program in college. Students will be expected to complete the readings and problems assigned as well as supplement their understanding of the material with outside sources.

Course Title: [Bioinformatics](#)**

Course Number: 01_5003_030

Grade Level: 11, 12

Credits: 5

Pre-Requisite: Successful completion of Math Analysis

Core Requirement: This course may be used to satisfy the UCVTS fourth year science requirement.

Computational tools are at the forefront of modern medical research including areas such as drug discovery, cancer research, and personalized medicine. This course will introduce students to the fundamental concepts and methods in computational biology, a field encompassing the interface of molecular biology, genetics, and computing. Students will survey a wide range of topics including biological databases, sequence analysis, gene finding, and protein structure analysis. Students will gain practical experience with bioinformatics tools and develop basic skills in the collection and presentation of bioinformatics data, as well as the fundamentals of programming in a scripting language.

***This course is offered in conjunction with The Academy for Allied Health Sciences. AIT and AAHS students are given priority enrollment in this course.*

CAREER AND TECHNICAL EDUCATION AT UCVTS

Courses below are Career and Technical Education courses at other UCVTS high schools that may be available to AIT students. AIT students do not have priority enrollment in these courses. Additional information can be found in the Academic Program Guide of the offering school.

Course Title: Medical Ethics

Course Number: 01_5004_020

Grade Level: 11, 12

Credits: 2.5

Offering School: AAHS with next priority for UCT EXP, CC

Course Title: Scientific Principles of Nutrition*

Course Number: 01_5006_020

Grade Level: 11, 12

Credits: 2.5

Offering School: AAHS with next priority for UCT EXP, CC

Course Title: [Introduction to Forensic Medicine](#)

Course Number: 01_5007_020

Grade Level: 11, 12

Credits: 2.5

Pre-Requisite: Successful completion of Biology

Offering School: AAHS with next priority for UCT CC

Course Title: [Microbiology](#)

Course Number: 01_5009_020

Grade Level: 11, 12

Credits: 5

Pre-Requisite: Successful completion of Biology

Core Requirement: This course may be used to satisfy the UCVTS fourth year science requirement.

Offering School: AAHS with next priority for UCT EXP, CC

Course Title: AP Psychology Grade Level: 11, 12 Pre-Requisite: 85 or higher recommended in US History I Offering School: AAHS	Course Number: 01_5010_020 Credits: 5
Course Title: Biochemistry for Health Sciences Grade Level: 11, 12 Pre-Requisite: Successful completion of Biology and Chemistry Core Requirement: This course may be used to satisfy the UCVTS fourth year science requirement. Offering School: AAHS <i>with next priority for UCT EXP, CC</i>	Course Number: 01_5011_020 Credits: 5
Course Title: Bioinformatics Grade Level: 11, 12 Pre-Requisite: Successful completion of Math Analysis Core Requirement: This course may be used to satisfy the UCVTS fourth year science requirement. Offering School: AAHS and AIT	Course Number: 01_5003_030 Credits: 5
Course Title: Medical Illustration Grade Level: 11, 12 Pre-Requisite: Successful completion of Anatomy & Physiology I Offering School: AAHS <i>with next priority for UCT EXP, CC</i>	Course Number: 01_5012_020 Credits: 2.5
Course Title: Physiology of Stress Grade Level: 12 Pre-Requisite: Successful completion of Anatomy & Physiology I Offering School: AAHS <i>with next priority for UCT EXP, CC</i>	Course Number: 01_5013_020 Credits: 2.5
Course Title: Introduction to EKG Interpretation Grade Level: 11, 12 Pre-Requisite: Successful completion of Biology Offering School: AAHS <i>with next priority for UCT EXP, CC</i>	Course Number: TBD Credits: 2.5
Course Title: Health Outcomes and Social Justice Grade Level: 11, 12 Offering School: AAHS <i>with next priority for UCT EXP, CC, ALJ</i>	Course Number: TBD Credits: 2.5
Course Title: Healthcare Policy: Politics and Power Grade Level: 11, 12 Offering School: AAHS <i>with next priority for UCT EXP, CC, ALJ</i>	Course Number: TBA Credits: 2.5
Course Title: Technical Theatre Lab for Non-Majors Grade Level: 11, 12 Offering School: APA	Course Number: 01_5003_035 Credits: 2.5
Course Title: Dance Lab for Non-Majors Grade Level: 11, 12 Offering School: APA	Course Number: 01_5004_035 Credits: 2.5

Course Title: [Creative Writing](#) **Course Number:** 01_5005_035
Grade Level: 11, 12 **Credits:** 2.5
Offering School: APA

Course Title: Music Technology **Course Number:** TBD
Grade Level: 11, 12 **Credits:** 2.5
Offering School: APA

Course Title: [Electrical Engineering Concepts](#) **Course Number:** 01_5004_040
Grade Level: 11, 12 **Credits:** 2.5
Pre-Requisite: Successful completion of or current enrollment in Geometry/Trigonometry
Offering School: MHS

Course Title: [Civil Engineering Design](#) **Course Number:** 01_5003_040
Grade Level: 11, 12 **Credits:** 2.5
Offering School: MHS

Course Title: [Engineering Ethics](#) **Course Number:** TBD
Grade Level: 11, 12 **Credits:** 2.5
Offering School: MHS

Course Title: [Electrical Engineering Concepts](#) **Course Number:** 01_5004_040
Grade Level: 11, 12 **Credits:** 2.5
Pre-Requisite: Successful completion of or current enrollment in Geometry/Trigonometry
Offering School: MHS

Course Title: [Civil Engineering Design](#) **Course Number:** 01_5003_040
Grade Level: 11, 12 **Credits:** 2.5
Offering School: MHS

Course Title: [Aerospace Engineering](#) **Course Number:** 01_5005_040
Grade Level: 11, 12 **Credits:** 2.5
Pre-Requisite: Successful completion of or current enrollment in Physics
Offering School: MHS

Course Title: [Robotics](#) **Course Number:** 01_5007_040
Grade Level: 11, 12 **Credits:** 2.5
Offering School: MHS

Course Title: [Environmental Engineering](#) **Course Number:** 01_5009_040
Grade Level: 11, 12 **Credits:** 5
Pre-Requisite: Successful completion of Biology and Chemistry; successful completion or current enrollment in Math Analysis
Core Requirement: This course may be used to satisfy a UCVTS science requirement.
Offering School: MHS

Course Title: [Introduction to Chemical Engineering](#) **Course Number:** 01_5010_040
Grade Level: 11, 12 **Credits:** 2.5
Pre-Requisite: Successful completion of Chemistry and successful completion or current enrollment in Physics
Core Req: This course may be used to satisfy a UCVTS science requirement in conjunction with Biochemistry

Offering School: MHS

Course Title: [Biochemistry](#)

Course Number: 01_5011_040

Grade Level: 11, 12

Credits: 2.5

Pre-Requisite: Successful completion of Chemistry

Core Requirement: This course may be used to satisfy a UCVTS science requirement in conjunction with Introduction to Chemical Engineering

Offering School: MHS

Course Title: [Fundamentals of Biomedical Engineering](#)

Course Number: 01_5014_040

Grade Level: 11, 12

Credits: 5

Pre-Requisite: Successful completion of Biology and Chemistry; successful completion of or current enrollment in Physics

Core Requirement: This course may be used to satisfy a UCVTS science requirement.

Offering School: MHS

Course Title: Principles of Agricultural Science - Animal Science

Course Number: TBA

Grade Level: 11,12

Credits: 5

Pre-Requisite: Successful completion of Biology and Chemistry;

Core Requirement: This course may be used to satisfy a UCVTS science requirement.

Offering School: UCT Sustainable Sciences

ENGLISH

Course Title: [World Literature](#)

Course Number: 02_1001_030

Grade Level: 9

Credits: 5

The World Literature course is designed to expose students to a variety of countries and forms of literature. While participating in individual and class assignments, students will have an opportunity to explore a multitude of cultures. This experience is further enhanced by joint projects and activities which occur between the World History and World Literature classes. A large emphasis is placed on common themes to help students understand and appreciate the similar human conditions that exist in all cultures. These themes include the struggle with intolerance, love, coping with death, metamorphoses, and communion with nature. Many of the selections read and discussed in class come from China, India, Africa, Egypt, the Middle East, Greece, Rome, and Europe during the Middle Ages and Renaissance period. Types of literature covered include the novel, epic poem, poetry, critical essays, editorials, short stories, drama/plays, and several classical selections. In addition to reading, students will be required to write several different forms of literature, essays, and one major research paper.

Course Title: [Early American Literature](#)

Course Number: 02_2001_030

Grade Level: 10

Credits: 5

Pre-Requisite: Successful completion of World Literature

The Early and Modern American Literature courses are designed to take the students through an in-depth study of the individual writings that shape and document the American literary tradition. Students will have an opportunity to explore primary texts, novels, poems, and other artistic productions through participation in both individual and group assignments. This experience is further developed through an integrated curriculum with United States History I. A major goal of the course is for the student to come to understand the culture and history of expression of our nation and his or her place within that tradition. Writing and language arts skills are stressed throughout the year's course of study. Many of the selections read and discussed in class come from the conventional cannon of American Literature, but extend beyond to art, dance, writings, and other materials gleaned from pop-culture, cultures excluded from traditional studies, and

other sources. The outline for the course of study is chronological. Early American Literature begins with the Native American cultures and their initial contact with European explorers and settlers, continues through Colonial and Revolutionary America, all the way through the end of the Nineteenth Century. Specific units also deal with Growth and expansion of the 1820s to 1850s, the Civil War, Reconstruction, Industrialization and Immigration, and the Gilded Age.

Course Title: [Modern American Literature](#)

Course Number: 02_3001_030

Grade Level: 11

Credits: 5

Pre-Requisite: Successful completion of Early American Literature

Modern American Literature closely parallels US History II in its chronological, psycho-social, thematic-based approach to the continuation of the American literary experience through intense individual and group readings and analyses of literary works spanning American Literature from 1865 (Twain) through the 20th Century (World Wars I and II, Post-War 1950's, the 1960's, 1970's, 1980's, 1990's) to Contemporary works of the 21st Century. Novels include, but are not limited to, *The Sun Also Rises*, *To Kill a Mockingbird*, *Catcher in the Rye*, *Fahrenheit 451*. The drama *A Streetcar Named Desire* may also be read and the film viewed for additional immersion in the study of play-writing and producing for the student who possesses a penchant for the genre. Independent studies are strongly encouraged and instructor-facilitated. Emphasis is placed upon further developing and mastering of grammatical techniques and continued exposure to the Writing Process Approach employed to enhance student written production (i.e. narrative, persuasive, informational, creative writing), as well as to facilitate successful outcomes on standardized test-taking. Through advanced study and immersion in a myriad of learning environs, the student will independently select a literary research topic, develop a thesis, and produce a research paper following MLA Documentation Style guidelines. Focus is on student integration of the relationship between literacy and the world as an impetus for developing a continuing appreciation for the acquisition of knowledge

Course Title: [Modern and Contemporary British Literature](#)

Course Number: 02_4001_999

Grade Level: 12

Credits: 5

Pre-Requisite: Successful completion of Modern American Literature

This course will focus on a chronological study of modern and contemporary British Literature. The student will be exposed to various forms of literature from poetry and short stories to dramas and novels. In addition, students will be expected to demonstrate a strong command of their writing skills through essay writing, critical writing, creative writing, and a research paper, and to focus on clear development of literary analysis. Class participation and public speaking will be essential to the group dynamic of the course and will be used to enhance the information of the texts with personal interpretation and discussion.

Course Title: [AP English Literature & Composition](#)

Course Number: 02_4002_999

Grade Level: 12

Credits: 5

Pre-Requisite: 85 or higher recommended in Modern American Literature

The AP English Literature and Composition class will be a combination of preparation for the AP English Literature and Composition Exam to be taken in May as well as a collegiate level study of literature and writing. Through a curriculum outlined by the College Board, the class will enable students to read and understand complex texts and demonstrate this understanding through mature and effective writing. The literature of the course can be broken down into three genres: poetry, drama, and fiction (novel and short story). Close reading will revolve around the experience, interpretation, and evaluation of literature. Students will be expected to read deliberately and thoroughly, taking time to understand a work's complexity, to absorb its richness of meaning, and to analyze how that meaning is embodied in literary form. Concurrently, students will be expected to have a strong background in grammar in order to focus intense concentration on enhancing their abilities in analytical and critical writing. Various forms of writing will be emphasized and frequent writing assignments of varying lengths with several drafts should be expected.

Course Title: [AP English Language & Composition](#)

Course Number: 02_5001_999

Grade Level: 12

Credits: 5

Pre-Requisite: 85 or higher recommended in Modern American Literature

The AP English Language & Composition provides students the opportunity to learn the principles of argument and rhetoric with frequent opportunities to analyze a variety of nonfiction texts, including essays, speeches, letters, and narratives. Students will learn how to develop an effective argument, analyze the arguments of others, and recognize logical fallacies. Research papers are required.

Course Title: [Dramatic Literature: Modern Drama](#)

Course Number: 02_5003_999

Grade Level: 12

Credits: 5

Core Requirement: This course may be used to satisfy the AIT fourth year English requirement.

Students will read and analyze a variety of dramatic works, from classical to contemporary (origins of drama, Elizabethan drama, Restoration: 18th to 19th century drama, 20th century drama, contemporary drama). Major plays and playwrights from world theaters will be discussed. Texts will be studied in chronological order. Through close readings of selected literary works, students will enhance and increase their development of literary and analytical skills. In addition to discussion and essay writing, students will be required to engage in staged performances and scenes from the works in question.

Course Title: [Contemporary Literature Through Graphic Novels](#)

Course Number: TBD

Grade Level: 12

Credits: 2.5

Core Requirement: This course may be used to satisfy the AIT fourth year English requirement.

Course Title: [Writers of the African Diaspora](#)

Course Number: 02_5005_999

Grade Level: 12

Credits: 5

Core Requirement: This course may be used to satisfy the AIT fourth year English requirement.

Students in this course will be introduced to the works of African American individuals from the periods of slavery to the great Harlem Renaissance to the contemporary era. Through close readings of selected literary works, students will enhance and increase their development of literary and analytical skills. Reading selections will include fiction, nonfiction, drama, and poetry. The writing assignments will consist of the modes of exposition, literary analysis, narration, and description.

Course Title: [Film and Literature: Mirrors and Windows](#)

Course Number: TBD

Grade Level: 11,12

Credits: 2.5

Core Requirement: This course may be used to satisfy the AIT fourth year English requirement if combined with another required semester core English course.

Students in this course will be introduced to the works of African American individuals from the periods of slavery to the great Harlem Renaissance to the contemporary era. Through close readings of selected literary works, students will enhance and increase their development of literary and analytical skills. Reading selections will include fiction, nonfiction, drama, and poetry. The writing assignments will consist of the modes of exposition, literary analysis, narration, and description.

Course Title: LGBTQ+ Literature

Course Number: 02_5006_999

Grade Level: 11, 12

Credits: 2.5

Core Requirement: This course may be used to satisfy the AIT fourth year English requirement if combined with another required semester core English course.

LGBT Literature would highlight queer authors, narratives, and history. The course would begin with an introduction to queer literature theory and using the lens of gender and sexuality to analyze texts. From there, the course will go to “closet literature,” or texts where the queer element is not outright but reliant on subtext and historical context (The Picture of Dorian Gray, for example). The course will then move to more modern texts, split into pre- and post-Stonewall writings, where students will analyze how shifting cultural climates affected authors and texts. As an elective, the course will not rely heavily on essays, but students will be expected to participate in daily discussions, as well as produce shorter written responses.

Course Title: [AP African American Studies](#)

Course Number: 02_5005_999

Grade Level: 12

Credits: 5

Core Requirement: This course may *not* be used to satisfy the AIT fourth year English requirement and is offered as an elective opportunity only.

AP African American Studies is a multidisciplinary course that examines the diversity of African American experiences through direct encounters with authentic and varied sources. The course focuses on four thematic units that move across the instructional year chronologically, providing students opportunities to delve into key topics that extend from the medieval kingdoms of West Africa to the ongoing challenges and achievements of the contemporary moment. Given the multidisciplinary character of African American studies, students in the AP course will develop skills across multiple disciplines, with an emphasis on historical, literary, visual, and data analysis skills. This new course foregrounds a study of the diversity of Black communities in the United States while considering the broader context of Africa and the African diaspora.

SOCIAL STUDIES

Course Title: [World History](#)

Course Number: 03_1001_030

Grade Level: 9

Credits: 5

This course explores the world history, economics, and geography from 1450 C.E. to the present. Geographic influences on history will be explored, as will political boundaries that developed with the evolution of nations. Significant attention will be given to the ways in which scientific and technological revolutions created new economic conditions that in turn produced social and political changes. Noteworthy people and events of the nineteenth and twentieth centuries will be emphasized for their strong connections to contemporary issues. The course utilizes various elements of technology and interdisciplinary philosophies to meet the needs of the students as well as the goals of the instructor.

Course Title: United States History I

Course Number: 03_2001_030

Grade Level: 10

Credits: 5

Pre-Requisite: Successful completion of World History

This course involves the study of the development of the North American continent from the late 16th century through the late 19th century. The course analyzes the political, economic, and social factors that led to the creation of modern democracy and the struggle to keep this grand experiment alive. Specific topics that are discussed start with the arrival of the British, Spanish, and French in the 1500's, their interaction with the native populations, Colonial America, the Revolutionary War, the writing of the United States Constitution, the Civil War, Slavery, and Industrial Growth in America. The course utilizes various elements of technology and interdisciplinary philosophies to meet the needs of the students as well as the goals of the instructor.

Course Title: [United States History II](#)

Course Number: 03_3001_030

Grade Level: 11

Credits: 5

Pre-Requisite: Successful completion of United States History I

In this course, students will study the social, political, and economic characteristics of the United States from 1880 to the present. Topics will include American Imperialism, Progressivism, the United States at War, the Great Depression, the Sixties, and the Vietnam Conflict, among others. Students will take part in a variety of activities geared to accommodate different learning styles. These activities include simulations, writing exercises, cooperative learning, and visual and audible expression.

Course Title: AP United States History

Course Number: 03_5001_999

Grade Level: 12

Credits: 5

Pre-Requisite: 85 or higher recommended in US History II

The AP United States History course is designed to provide students with the analytic skills and factual knowledge necessary to deal critically with the problems and materials in U.S. history. The course prepares students for intermediate and advanced college courses by making demands upon them equivalent to those made by full year introductory college courses. Students should learn to assess historical materials – their relevance to a given interpretive problem, reliability, and importance – and to weigh the evidence and interpretations presented in historical scholarship. An AP U.S. History course should thus develop the skills necessary to arrive at conclusions on the basis of an informed judgment and to present reasons and evidence clearly and persuasively in essay format. Topics covered will include: American diversity, American identity, culture, demographic changes, economic transformations, environment, globalization, politics and citizenship, reform, religion, slavery and its legacies in North America, and war and diplomacy.

Course Title: [AP U.S. Government & Politics](#)

Course Number: 03_5002_999

Grade Level: 12

Credits: 5

Pre-Requisite: 85 or higher recommended in US History II

This course will give students an analytical perspective on government and politics in the United States. The course includes both the study of general concepts used to interpret U.S. politics and the analysis of specific examples. It also requires familiarity with the various institutions, groups, beliefs, and ideas that constitute U.S. politics. Topics of discussion include: The U.S. Constitution, political parties, interest groups, mass media, public policy, civil rights, and civil liberties. Students are expected to be up-to-date on current events in order to facilitate discussion.

Course Title: [AP European History](#)

Course Number: 03_5003_999

Grade Level: 12

Credits: 5

Pre-Requisite: 85 or higher recommended in US History II

The goals of the AP European History course are for students to gain knowledge of basic chronology of major events and trends from approximately 1450 to the present. Also, students will develop an understanding of some of the principal themes in modern European history including intellectual and cultural history, political and diplomatic history as well as social and economic history. Finally, the students will gain an ability to analyze historical evidence, as well as express historical understanding in writing. This is a demanding course for students with a serious interest in history. Students will be expected to interpret and analyze historical documents as well as identify trends over time.

Course Title: [Genocide Studies & The Holocaust](#)

Course Number: 03_5004_999

Grade Level: 11, 12

Credits: 5

This course will be an examination of the history of genocide, including the causes and consequences of

genocides. The students will examine the psychological and sociological aspects of genocides, including hate and prejudice, de facto and de jure discrimination, and organized violence towards specific groups. The course will specifically analyze genocides and compare and contrast the unique settings of each, including the genocides within Africa, Asia, and Europe. Topics will include possible genocides in the Ottoman Empire, Soviet Union, Germany, China, Cambodia, Bosnia, Rwanda, and the Sudan. Studies will be done utilizing primary and secondary sources, literature, and film. The class will help students attain a detailed understanding of human rights, international policy, and the social studies. Furthermore, students will gain a deeper appreciation for different cultures and religions around the world. Students will learn the complex interactions between different groups of people and the consequences of prejudice and discrimination between these groups. The course will challenge the students to utilize critical thinking skills to improve the world.

Course Title: War & Conflict in Modern America
Grade Level: 11, 12

Course Number: 03_5005_999
Credits: 5

This course will examine wars and conflicts throughout recent American history, beginning with World War I. Events will be compared and contrasted through a case study approach. Students will attempt to answer big idea or essential questions using primary and secondary sources as evidence. In particular, students will explore what factors cause wars to become unpopular, when a war is likely to be supported by the American people, and how different groups (racial, gender, or ethnic) treated during American wars. The course will target student growth in interdisciplinary skills including reading and analyzing information texts, forming and writing independent views, using data and statistics to analyze the costs/benefits of war, and looking at how science and technology have impacted war through the years.

Course Title: [United States History Through Crime](#) **
Grade Level: 11, 12

Course Number: 03_5006_999
Credits: 5

This course is an examination of the modern history of the United States through the crimes that were committed during the time period. Beginning in September, students will engage in a thorough analysis of the psychology of criminals, the establishment of criminal law in the United States, and an evaluation of the justice system for crimes committed in each time period. The course will specifically analyze how mass crimes are a representation of the major issues within a time period, and how learning about these crimes can help one understand that time period. Topics will include mass resistance after the U.S. Civil War, political corruption in the Gilded Age, domestic terrorism during the First Red Scare, bootlegging and gangsters of the 1920s, bank robberies of the Great Depression, treason and espionage during the Cold War, the crimes of the rebellious 1960s (serial killers, cults, and drugs), and the gang wars of the late 20th century. Studies will be done utilizing primary and secondary sources, literature, and film. The culmination of the course will be a thorough analysis of mass domestic terrorism in the 21st century to create hypotheses of why these crimes are occurring presently and how society and/or the government can solve these issues.

***This course is offered in conjunction with The Academy for Law & Justice. ALJ students are given priority enrollment in this course.*

Course Title: AP Human Geography
Grade Level: 12

Course Number: 03_5007_999
Credits: 5

AP Human Geography introduces students to the systematic study of patterns and processes that have shaped human understanding, use, and alteration of Earth's surface. Students employ spatial concepts and landscape analysis to examine socioeconomic organization and its environmental consequences. They also learn about the methods and tools geographers use in their research and applications. The curriculum reflects the goals of the National Geography Standards (2012). The course is equivalent to an introductory college-level course in human geography.

Course Title: Race and Media
Grade Level: 11, 12

Course Number: 03_5008_999
Credits: 2.5

Students in Race and Media will learn how the historical roots of racial stereotypes and biases, how media has perpetuated and worsened those stereotypes, and what can be done to overcome implicit biases. Students in this course should expect to complete a parent permission form, due to the nature of the course content and the harmful stereotypes and language in it. Some media will include films and radio plays, television, news media, and popular music. Blackface, yellowface, brownface and their impacts will be discussed.

MATHEMATICS

Course Title: [Combined Algebra](#)
Grade Level: 9

Course Number: 04_1001_030
Credits: 5

Combined Algebra is an in-depth coverage of all topics in a traditional Algebra I course and most topics in a traditional Algebra II course. These topics include the study of linear equations, absolute value equations, quadratic equations and parabolas, functions, basic matrix operations, linear inequalities, systems of equations and inequalities, polynomial and rational equations, and powers, exponents, and radicals. This is a rigorous course with an emphasis on problem solving, working collaboratively, and communicating mathematically in both written and oral form.

Course Title: [Geometry/Trigonometry](#)
Grade Level: as determined by UCVTS Placement Test

Course Number: 04_2001_030
Credits: 5

Pre-Requisite: Successful completion of Combined Algebra or placement test results

Geometry/Trigonometry is an in-depth coverage of plane and solid geometry with additional study of selected topics from plane trigonometry and discrete mathematics. Geometry topics include the study of reasoning and logic, proofs, constructions, lines, triangles, polygons, circles, similarity, congruence, transformations, planar and space measurements. Trigonometry topics include trigonometric ratios as defined for the right triangle and unit circle, reciprocal, quotient and Pythagorean identities, inverse trigonometric functions, Law of Sines and Law of Cosines. Discrete mathematics topics include basic principles of iteration, recursion, and mathematical induction, which are used to solve combinatorial and algorithmic problems. Geometry/Trigonometry is a rigorous course with an emphasis on problem solving, working collaboratively, and communicating mathematically in both written and oral form. Appropriate computer software as well as educational media is used to introduce and reinforce concepts visually.

Course Title: [Math Analysis](#)
Grade Level: as determined by UCVTS Placement Test

Course Number: 04_3001_030
Credits: 5

Pre-Requisite: Successful completion of Geometry/Trigonometry or placement test results

Math Analysis is an in-depth coverage of advanced algebra as well as the rigorous study of pre-calculus. Topics include real numbers, exponents and radicals, polynomials and factoring, fractional expressions, solving equations and inequalities, functions and their graphs, polynomial and rational functions, complex numbers, exponential and logarithmic functions, trigonometric functions, analytic trigonometry, analytic geometry/conic sections, series and sequences, probability, statistics and data analysis, linear algebra and matrix mathematics and determinants. Connections between algebra, geometry, and trigonometry will be made. These topics form the foundation for the successful study of calculus. Math Analysis is a rigorous course with an emphasis on developing problem-solving and reasoning abilities, the use of graphing calculators, communicating mathematically in both written and oral form, and solving real life problems.

Course Title: [Calculus](#)

Grade Level: as determined by UCVTS Placement Test

Pre-Requisite: Successful completion of Math Analysis

Course Number: 04_4001_999

Credits: 5

The Calculus course is an alternative to the AP Calculus I/AB course. It is designed specifically for students not planning on taking the AP Calculus Exam. However, most of the topics covered in the college-level AP course will also be covered here at a slower pace. The course emphasizes a multi-representational approach to calculus, with concepts, results, and problems being expressed geometrically, numerically, analytically, and verbally. Topics covered include the initial review of pre-calculus topics, limits, differentiation and its applications, and integration and its applications. There is an emphasis on problem solving, working collaboratively, and communicating mathematically in both written and oral form.

Course Title: [AP Calculus I/AB](#)

Course Number: 04_4002_999

Grade Level: as determined by UCVTS Placement Test

Pre-Requisite: 85 or higher recommended in Math Analysis

Credits: 5

AP Calculus I/AB is a rigorous college-level course which emphasizes a multi-representational approach to calculus, with concepts, results, and problems being expressed geometrically, numerically, analytically, and verbally. Topics covered include the initial review of pre-calculus topics, limits, differentiation and its applications, and integration and its applications. There is an emphasis on problem solving, working collaboratively, and communicating mathematically in both written and oral form. Since this is an Advanced Placement college-level course, students are expected to spend a considerable amount of time outside of class in homework preparation and daily studying.

Course Title: [AP Calculus II/BC](#)

Grade Level: as determined by UCVTS Placement Test

Pre-Requisite: 85 or higher recommended in AP Calculus I/AB

Course Number: 04_5001_999

Credits: 5

AP Calculus II/BC is a rigorous college level course that emphasizes a multi-representational approach to calculus. Students learn to express mathematical concepts geometrically, numerically, analytically, and verbally. As a continuation of Calculus I, topics covered in this class include applications and techniques of integration, L'Hopitals' Rule, improper integrals, an introduction to differential equations, infinite series and sequences, conic sections, parametric and polar equations. As in Calculus I, problem solving and mathematical communication in written and oral form are an essential component of this course. All students are expected to spend considerable time outside of class in homework preparation and daily study.

Course Title: [Multivariable Calculus](#)

Grade Level: as determined by UCVTS Placement Test

Pre-Requisite: Successful completion of AP Calculus II/BC

Co-Requisite: Course Sequenced with Linear Algebra

Course Number: 04_5002_999

Credits: 2.5

Multivariable Calculus, also known as Calculus III, is part of the core college math curriculum for science, engineering, math, computer science, and other disciplines which is typically taken by students during the first half of their sophomore year in college. As a continuation from AP Calculus II/BC, students will need a strong working knowledge of differentiation and integration techniques. Topics include vector functions and the geometry of space, differentiation and integration of functions with several variables, multiple integrals, partial derivatives, directional derivatives, optimization, line integrals, Green's Theorem, vector analysis, and related applications. Problem solving and mathematical communication in written and verbal forms are an essential component of this course, as well as working in a collaborative learning environment. Students are expected to

spend a considerable amount of time outside the class of homework and daily preparation.

Course Title: [Linear Algebra](#)

Course Number: 04_5008_999

Grade Level: as determined by UCVTS Placement Test

Credits: 2.5

Pre-Requisite: Successful completion of AP Calculus II/BC

Co-Requisite: Course Sequenced with Multivariable Calculus

An introductory Linear Algebra is part of the core college math curriculum for science, engineering, math, computer science, and other disciplines which is typically taken by students during the second half of their sophomore year in college. The course covers the fundamentals of vector spaces and linear transformations on an axiomatic basis. Topics include: solutions of linear systems, matrix algebra over the real numbers, linear independence, bases and dimension, eigenvalues/eigenvectors, and determinants. As a prominent real-world application, the course will include an introduction to Linear Programming (LP) and the fundamental concepts behind the Simplex Algorithm for solving LPs. Students will be expected to model, solve, and interpret the solutions of LPs. Students are expected to spend a considerable amount of time outside the class on homework and daily preparation.

Course Title: [Mathematical Statistics and Data Sciences](#)

Course Number: 04_5006_999

Grade Level: 12

Credits: 5

Pre-Requisite: Successful completion of or current enrollment in Multivariable Calculus/Linear Algebra

This course can qualify as a junior/senior-level college subject that provides a strong core foundation in graduate level statistics and data sciences, which are heavily used throughout industry. Coursework will include a calculus-based approach to probability and statistics, beginning with probability axioms, which will be used to derive and discuss various discrete and continuous probability distributions, along with their applications to statistical analysis. Major topics will include: random variables, distribution functions and expectation, special parametric families of univariate distributions, joint and conditional distributions, stochastic independence, sampling and sampling distributions, parametric point and interval estimation, and testing of hypotheses. Students will use R-Programming Language to acquire and analyze (reduction, visualization, summarizations, correlating, etc) raw data to prepare for formal analyses (e.g. modeling, linear regression, estimation, testing, etc.). Students will use single and multiple-variable regression techniques to model and validate data as part of a capstone project to close out the course.

Course Title: [Probability & Statistics](#)

Course Number: 04_5004_999

Grade Level: 12

Credits: 5

Pre-Requisite: Successful completion of Math Analysis

Probability and Statistics is an introductory course in descriptive statistics and statistical inference including the study of probability. Topics of study include summary statistics, graphical displays of data, sampling, probability distributions, confidence intervals and significance testing. Practical problems involving correlation, linear regression, surveys, experiments and hypothesis testing are also included. There will be an emphasis on developing a critical perspective of data and statistical analyses as they are presented in popular culture. Problem-solving and reasoning abilities will be enhanced.

Course Title: [AP Statistics](#)

Course Number: 04_5005_999

Grade Level: 12

Credits: 5

Pre-Requisite: 85 or higher recommended in Math Analysis

AP Statistics is an intensive course that introduces students to the major concepts and tools for drawing conclusions from data. Areas of study include data analysis, regression analysis, probability, sampling and experimentation, and statistical inference. Theory and practice involve summary statistics and graphical displays of data, correlation, linear regression, survey design and implementation, design of experiments, probability distributions, confidence intervals and hypothesis testing. Graphing calculator, statistical software,

and written and oral communication skills will be developed by solving real-life problems and interpreting the results using actual data.

Course Title: [Business Intelligence & Analytics](#)

Course Number: 04_5006_030

Grade Level: 12

Credits: 5

Pre-Requisite: Successful completion of Math Analysis

Core Requirement: This course is the required AIT fourth year math requirement for BIG Opportunity pathway students and is available only to students on the BIG Opportunity pathway.

This course is designed to teach students how to use data to assist in understanding the success or failure of a business or organization and to make decisions that will yield a competitive advantage or help an organization better fulfill its mission. Data analysis, regression, time series and forecasting, text analysis, game theory, business calculus, graphics, and simulations will be among the tools explored by students to solve authentic business and organizational problems in a case study approach. This course will guide students to answer the question, “What do I do when I have no model to follow?” The culminating project of this course will have students apply what they have learned about using descriptive and predictive analytics to optimize components of a business or organization. Topics could include marketing, finance, operations, hiring and retention, or new ventures.

SCIENCE

Course Title: [Biology](#)

Course Number: 05_1001_030

Grade Level: 9

Credits: 6

Biology I is a laboratory based course which will emphasize the scientific method and current biological techniques that will challenge students to think creatively, make critical evaluations of their own work, and provide them with a model for interpreting the world around them. Students will develop the fundamental skills of problem-solving, concise writing, expressing original ideas, reading critically, and public speaking. The course is designed as an introductory course for first year students. However, it will delve into the more complex details by examining biology at a molecular, cellular, organismal and ecological level. Therefore, not only should it complement their previous experience with the life sciences, but also intrigue and entice those students interested in a biology-related career to pursue further studies in the field of Biological Sciences.

Course Title: [Scientific Inquiry & Analysis](#)

Course Number: 05_1002_030

Grade Level: 9

Credits: 5

Scientific Inquiry and Analysis is an interdisciplinary full year course. The course emphasizes development of skills that are common to the various disciplines of science. Students will obtain proficiency in the use of graphing calculators and computers within scientific contexts. In particular, students will utilize technology for scientific data acquisition, mathematical analysis of data, and presentation of data obtained from a wide array of physical, biological, and social science contexts. Skills and procedures that are common to all laboratory sciences will be highlighted such as the scientific method, systems of measurement, unit conversions, significant figures, error analysis, laboratory reports, measurement tools and techniques, and experimental design. Additionally, the course will provide an introduction to the core concepts of physics and chemistry. Students will practice and apply a variety of methods for the collection, organization, description, and presentation of scientific data. In particular, students will use various mathematical models and techniques such as iteration, recursion, and the application of probability and statistics, to solve and analyze problems arising within the context of the sciences. The course will culminate in a student-designed, independent research project, through which students will apply skills and techniques learned in this course to analyze a real-world question.

Course Title: [Chemistry](#)

Course Number: 05_2001_030

Grade Level: 10

Credits: 6

Pre-Requisite: Successful completion of Biology and Scientific Inquiry and Analysis

Chemistry is a rigorous course intended to give the serious science student a well-rounded background in general chemistry. The student will be exposed to a variety of experiences both individually and in groups. It is designed on the principle that observation, experimentation, problem solving and reliance on mathematics is central to the development of an understanding of the subject. Hands-on activities emphasize safe laboratory practices and the aspects of applied chemistry. Topics covered include the scientific method, atomic structure, and molecular architecture, physical and chemical behavior of matter, quantitative and qualitative analysis, periodicity, laboratory technique, right-to-know and industrial chemistry. Since an accommodation to a variety of learning styles is stressed, students will be evaluated with a variety of criteria as well. Written homework, reports, class presentations, teacher-designed and standardized tests, class participation and observation of laboratory skills will be used to evaluate the student's general knowledge and academic success.

Course Title: [Physics](#)

Course Number: 05_3001_030

Grade Level: 11

Credits: 6

Pre-Requisite: Successful completion of Chemistry

Physics is an in-depth, rigorous course in which students study the behavior of the physical world. The course is designed to help students develop a broad background in general physics. Students will learn about Mechanics (motion, forces, and energy), Thermodynamics, Electricity and Magnetism, Waves, and Optics. Additional topics will be investigated as time permits. Physics emphasizes the development of reasoning and problem-solving abilities. Students will routinely utilize technology such as graphing calculators and computers for data collection and analysis, both in the classroom and in the laboratory. Hands-on laboratory experience is a fundamental part of the course, with algebra and trigonometry used extensively to analyze data. Students will learn to communicate scientifically and mathematically, in both written and oral forms, while investigating real-life phenomena.

Course Title: [AP Biology](#)

Course Number: 05_5001_999

Grade Level: 11, 12

Credits: 6

Pre-Requisite: 85 or higher recommended in Biology and Chemistry

AP Biology is designed to be the equivalent of a college introductory biology course. Three general areas of biology, molecules and cells, heredity and evolution, and organisms and populations, will be covered in detail. The two main goals of AP Biology are to help students develop a conceptual framework for modern biology and to help students gain an appreciation for science as a process. To gain conceptual understanding students must participate in scientific inquiry, recognize unifying themes that integrate the many parts of biology, and apply biological knowledge and critical thinking to environmental and social issues.

Course Title: [AP Chemistry](#)

Course Number: 05_5002_999

Grade Level: 11, 12

Credits: 6

Pre-Requisite: Successful completion of or current enrollment in Math Analysis; 85 or higher recommended in Chemistry

Chemistry is a rigorous course intended to give the serious science student a well-rounded background in general chemistry. The student will be exposed to a variety of experiences both individually and in groups. It is designed on the principle that observation, experimentation, problem solving and reliance on mathematics is central to the development of an understanding of the subject. Hands-on activities emphasize safe laboratory practices and the aspects of applied chemistry. Topics covered include the scientific method, atomic structure, and molecular architecture, physical and chemical behavior of matter, quantitative and qualitative analysis, periodicity, laboratory technique, right-to-know and industrial chemistry. Since an accommodation to a variety of learning styles is stressed, students will be evaluated with a variety of criteria as well. Written homework,

reports, class presentations, teacher-designed and standardized tests, class participation and observation of laboratory skills will be used to evaluate the student's general knowledge and academic success.

Course Title: [AP Physics C: Mechanics](#)

Course Number: 05_5003_999

Grade Level: 12

Credits: 6

Pre-Requisite: Successful completion of or current enrollment in AP Calculus I/AB; 85 or higher recommended in Physics

This is a calculus-based college-level continuation of the Physics course. The course is designed to be equivalent to the first semester of a typical college sequence in physics for science and engineering majors. Major areas of study include kinematics, forces and motion, work and energy, systems of particles, rotational dynamics and statics, gravitation, and oscillations. The main goal of the course is to further develop students' problem solving and critical thinking skills through in-depth investigation of classical mechanics. This course emphasizes problem solving, working collaboratively, and communicating scientifically in both written and oral form. Calculus is used extensively, both in developing and unifying concepts and in problem solving. The laboratory component of this course focuses on the design of experiments, with students developing skill in measuring, organizing, and analyzing data.

Course Title: [AP Physics C: Electricity & Magnetism](#)

Course Number: 05_5004_999

Grade Level: 12

Credits: 6

Pre-Requisite: Successful completion of AP Calculus I/AB; successful completion or current enrollment in Physics C: Mechanics

Electricity & Magnetism is a calculus-based college-level continuation of the Physics I course. The course is designed to be equivalent to the second semester of a typical college sequence in physics for science and engineering majors. The main goal of the course is to further develop students' problem solving and critical thinking skills through in-depth investigation of classical mechanics and electricity & magnetism. This course emphasizes problem solving, working collaboratively, and communicating scientifically in both written and oral form. Calculus is used extensively, both in developing and unifying concepts and in problem solving. The laboratory component of this course focuses on the design of experiments, with students developing skill in measuring, organizing, and analyzing data.

Course Title: [AP Environmental Science](#)

Course Number: 05_5012_999

Grade Level: 11, 12

Credits: 5

The goal of the AP Environmental Science course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving or preventing them.

Course Title: [The Chemistry of Food](#)

Course Number: TBD

Grade Level: 12

Credits: 5

The goal of this course is to provide students with the skills and knowledge to answer questions such as: How are the different types of food (Carbs, proteins, fats) processed. What happens in digestion? How does the way it's cooked (i.e. application of heat) affect the food. How do the proportions determine the outcome? What are the functions of vitamins?

Course Title: Chemistry for the Life Sciences

Course Number: TBD

Grade Level: 12

Credits: 5

The goal of this course is to provide students with the skills and knowledge to answer questions such as: What

chemicals build living things? How does chemistry impact our daily lives? How do the structures of organisms enable life's functions? What elements does carbon bond with to make up life's molecules? Why do we follow certain patterns in chemistry and in life? How do food and fuel provide energy? If energy is conserved, why do people say it is produced or used? How is matter and energy conserved in the universe? How does chemistry help us understand stability and change in the universe?

WORLD LANGUAGE

Course Title: [Spanish I](#)

Grade Level: 9

Course Number: 06_1001_999

Credits: 5

This course serves as an introduction to formal language study. Because language learning is a cumulative and cultural experience, the focus of the first level language course is to assist the student in establishing a foundation that he or she may build upon as language study continues. Interest in Hispanic culture will be stimulated by the study of culture, which provides a better understanding of the life, customs and speech of the people.

Course Title: [Spanish II](#)

Grade Level: as determined by UCVTS Placement Test

Pre-Requisite: Successful completion of Spanish I or placement test results

Course Number: 06_2001_999

Credits: 5

This intermediate course expands upon the foundations of Spanish 1 continuing the same communicative approach to further develop skills in listening, understanding, speaking, reading and writing of the Spanish language. Activities are used to expand interpersonal communication as well as interpretation and presentation skills. The course includes cultural experiences that allow students to expand their understanding of the Spanish culture through its products and practices.

Course Title: Spanish for Heritage & Native Speakers

Grade Level: 9

Pre-Requisite: Placement test results

Course Number: 06_2002_999

Credits: 5

This course is designed for incoming freshmen students for whom Spanish is a native or heritage language. This course provides those students with the opportunity to expand their existing proficiency and to develop their reading and writing skills. Orthography, diacritics, and vocabulary development are stressed. Emphasis will be placed on usage appropriate to academic and professional settings. This course will provide students with the opportunity to improve strategic speaking, reading, and writing skills, to master grammar points of particular concern to native and heritage speakers, and to enhance their understanding and appreciation of Hispanic cultures and sociopolitical realities. The course also aims to strengthen students' sociolinguistic awareness and critical thinking skills. Students will be expected to enter Spanish 3 upon successful completion of this course.

Course Title: [Spanish III](#)

Grade Level: as determined by UCVTS Placement Test

Pre-Requisite: Successful completion of Spanish II or placement test results

Course Number: 06_3001_999

Credits: 5

This course is designed to continue the communicative approach and objectives of levels I and II, as well as provide for a more in depth study of the structure of the Spanish language. Students will become more proficient in interpersonal communication, interpretation and presentation skills.

Course Title: [Spanish IV](#)

Grade Level: as determined by UCVTS Placement Test

Course Number: 06_4001_999

Credits: 5

Pre-Requisite: Successful completion of Spanish III

This course is designed to provide the student with a more in depth study of the Spanish language and culture. It will continue the same communicative approach but will focus on the more difficult nuances of the language and will include more reading than previous levels. Cultural experiences will be expanded to include a more in-depth study of the history, literature, art, economics and social issues of the culture. Students will use the language to make connections on topics they have learned in other core content areas. Instruction, as well as student participation, is exclusively in the Spanish language.

Course Title: [AP Spanish Language & Culture](#)

Course Number: 06_5001_999

Grade Level: as determined by UCVTS Placement Test

Credits: 5

Pre-Requisite: 85 or higher recommended in Spanish IV

The AP Spanish Language course is a rigorous course of study that is equivalent to a college level course. The fundamental objective of this course is for students to achieve a high level of capability in speaking, writing, reading, and listening. Since language and culture are inextricably bound together, cultural understanding should be developed along with these four language skills. Through the year different methods and strategies will be used to practice and develop the four skills. This class is conducted entirely in Spanish and students are encouraged to participate in all classroom activities using Spanish. Students will be exposed to all kinds of materials that will help them to reinforce and expand their knowledge of Spanish. This course offers a large variety of performance options such as dialogues, debates, presentations, and interviews in which students will demonstrate their abilities to communicate proficiently on topics of personal, academic or social nature.

Course Title: [AP Spanish Literature & Culture](#)

Course Number: 06_5002_999

Grade Level: as determined by UCVTS Placement Test

Credits: 5

Pre-Requisite: 85 or higher recommended in Spanish IV

The AP Spanish Literature and Culture course uses a thematic approach to introduce students to representative texts (short stories, novels, poetry, and essays) from Peninsular Spanish, Latin American, and United States Hispanic literature. Students continue to develop proficiencies across the full range of the modes of communication (interpersonal, presentational, and interpretive), honing their critical reading and analytical writing skills. Literature is examined within the context of its time and place, as students reflect on the many voices and cultures present in the required readings. The course also includes a strong focus on cultural connections and comparisons, including exploration of various media (e.g., art, film, articles, and literary criticism).

Course Title: [Linguistics](#)

Course Number: 06_5003_999

Grade Level: 11, 12

Credits: 5

The knowledge of a World Language is a universal tool that opens gateways to human understanding and presents a new approach to dealing with the everyday realities of life. Linguistics is at the base of every World Language. Student will be introduced to the history of a language, the core of a language, the people who speak different languages and the future of language to enhance those skills honed in World Language studies. Language study enhances understandings in other disciplines: history, geography, sociology, literature, and the arts. Linguistics takes these features, recognizes the connection between each branch of learning and language, and analyzes them further. Linguistics is the bridge between language and culture. An effective World Language program recognizes individual differences in learning patterns and abilities and offers options to students with diverse needs and interests. The study of Linguistics will harness these differences. Students will use their knowledge from previous language courses to build upon different skills.

HEALTH AND PHYSICAL EDUCATION

Students will take four years of Health and Fitness. Each year, they will take three marking periods of fitness and one marking period of health education.

Course Title: Fitness I – [II](#) – [III](#) - IV

Course Number: 07_1001_999; 07_2001_999; 07_3001_999; 07_4001_999

Grade Level: 9, 10, 11, 12

Credits: 3.75

This physical fitness course continues to assist students in attaining optimal wellness physically, mentally, emotionally and socially. The program once again offers activities which incorporate the five components of fitness: cardiovascular endurance, muscular endurance, muscle strength, flexibility and body composition. The Fitnessgram will be administered to measure students' fitness levels and help set fitness goals. The students will also be introduced to various sports activities as well as "Project Adventure". These activities are designed to promote enjoyment and foster an interest in sports, physical activity, and teamwork which can last a lifetime. The students will also participate in the annual Marine Corps Youth Physical Fitness Challenge. The top finishers among the boys and girls will go on to represent the school at the annual competition for the state of New Jersey.

Course Title: [Health I](#)

Grade Level: 9

Course Number: 07_1002_999

Credits: 1.25

The freshmen health education course is designed to assist the student in attaining optimal wellness physically, mentally, emotionally, and socially. Through discussion and research, the students will become better prepared to make responsible, health-enhancing decisions, communicate effectively, and adopt health practices to reduce preventable health problems for themselves, their families, and their communities. Topics will include nutrition, weight management and eating disorders, human sexuality, conception and birth, contraception, and STDs

Course Title: [Health II](#)

Grade Level: 10

Course Number: 07_2002_999

Credits: 1.25

Pre-Requisite: Successful completion of Health I

The sophomore health education course is designed to expose the students to character education. Character education consists of the six pillars of character: trust, respect, responsibility, caring, fairness and citizenship. This will help the students make better choices and decisions in regards to health and personal well-being. Topics covered include healthy relationships, self-esteem and tolerance. Video clips, short reading excerpts and role playing will be used in the class room along with class discussions.

Course Title: [Health III](#)

Grade Level: 11

Course Number: 07_3002_999

Credits: 1.25

Pre-Requisite: Successful completion of Health II

The Junior Health course consists of CPR and First Aid training and certification. It is designed to prepare students to recognize signs and symptoms of cardiac and respiratory distress and provide care for the victims of choking, respiratory arrest and cardiac arrest. It will enable students to provide care for victims suffering from severe bleeding, musculoskeletal injuries, sudden illness, soft tissue injuries and poisoning. Principles of anatomy and physiology are integrated to enhance students' understanding of how the human body systems interact and depend on each other. Knowledge of how the human body functions normally will help students identify appropriate care to give to an ill or injured person.

Course Title: [Health IV](#)

Grade Level: 12

Pre-Requisite: Successful completion of Health III

Course Number: 07_4002_999

Credits: 1.25

Senior Health will consist of substance use/abuse, mental illness, disabilities and health care. Students will be responsible for explaining the importance of mental and emotional health and determining the emotional, social and financial impact of mental illness on the family, community and state. Students will also determine the effects of accessibility and affordability of healthcare on family, community and the global health. Also, responsible choices will be emphasized as well as a review of sex education.

INTERDISCIPLINARY STUDIES

Course Title: Dance Appreciation

Grade Level: 10

Required Sophomore Course

Course Number: 08_1001_999

Credits: 5

The Dance Appreciation mini-course is designed to provide UCVTS students with an appreciation of world dance forms, social dance, musical theatre, and more specifically how and why dances are created. The course has a total of 10 classes. Students have 6 online classes which delve into basic terms used in choreography for in all dance forms. The online classes will also examine ritual dance and folk dance in several cultures, and include contemporary social dance. Students are given an opportunity to share any part dance has taken in their lives. Students also have 4 in-person classes which give them the tools to create choreography in any style of their choosing. Students will break into groups to create a short dance, 12 counts of 8, which will be performed in front of their class. All classes both online and practical are aligned with the NJ Core Curriculum Content Standards in Performing Arts-Dance, to fulfill the State Requirement in Visual and Performing Arts.