CAREER TECHNICAL EDUCATION PATHWAYS

LAHS PATHWAY

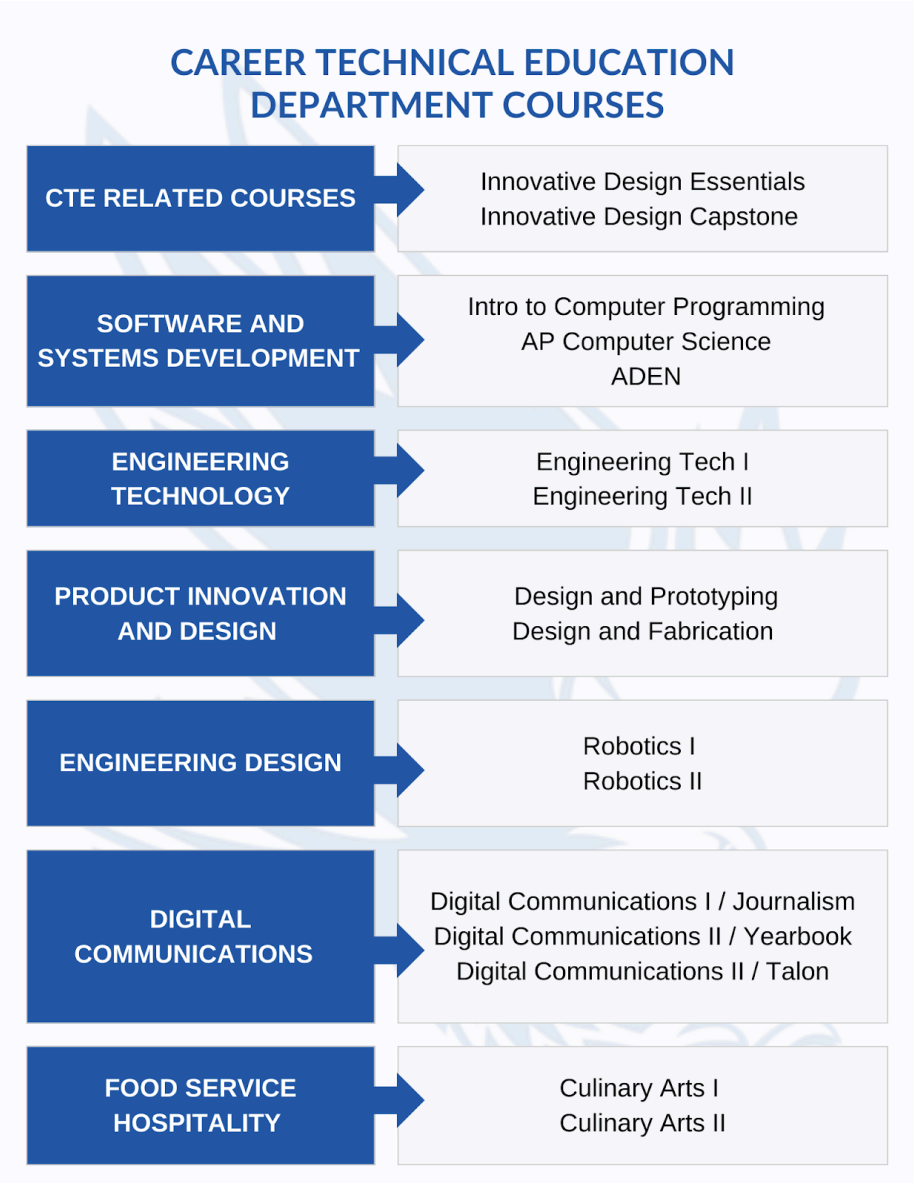
CTE

CTE Industry Sector	Pathway	Concentrator Course	Capstone Course
Engineering Architecture	Engineering Technology	Engineering Tech I	Engineering Tech II
Engineering Architecture	Engineering Design	Robotics I	Robotics II
Hospitality, Tourism & Recreation	Food Service Hospitality	^Culinary I	^Culinary II
Information & Communication Tech	Software & Systems Dev	*AP Computer Science	ADEN
Manufacturing & Product Dev	Product Innovation & Design	Design and Prototype	Design and Fabrication
Arts Media & Entertainment	Digital Communications	Digital Communications I	Digital Com II/ Yearbook
Arts Media & Entertainment	Digital Communications	Digital Communications I	Digital Com II/ Talon
Fashion and Interior Design	Fashion Design & Merch.	Fashion Design I	

*It is recommended that students take Intro to Computer Programing before AP Computer Science
^Certs are Certifications that students earn that are industry spec that help them prove they have the necessary skills to be hired in their industry

CAREER TECHNICAL EDUCATION (CTE)

Career and Technical Education courses are designed for students who are interested in learning about different career opportunities while they earn high school and in some cases, college credits. These courses are open to any students who are interested in making more educated decisions about their college and career goals through experiencing and learning in a CTE course. CTE courses are a sequence of two courses forming a career pathway. The first course is called a concentrator course, while the second course is called a capstone course. Taking the concentrator course in any pathway is highly recommended for the most engaging, immersive experience possible. CTE Courses are typically very hands-on, robust experiences where students learn by doing, and exploring the industry in which they are interested.



INNOVATIVE DESIGN CAPSTONE		BC2050
ELECTIVE	Grade 12	*UC-approved "g"*

This course follows two years of prior engineering, computer science or architectural design coursework and gives students the freedom to propose, design and refine their own project or professional certification. Students are expected to work in teams and collaborate on a long-term project utilizing emerging technologies and a range of skills. Students will present their project proposal to an industry panel and will receive feedback on their progress. Project proposals may fall under any of a variety of TED pathways including mechanical, civil, software or electrical engineering, computer science, app and game design, product design, architectural design, or other subjects as approved by the instructor. Students will follow their project through from conception to completion during the course of the year, and will document their design and manufacturing process as they develop a professional quality product. In addition to the specific design and technology skills that their project demands, students will develop skills in field research, project management, teamwork, leadership, time management, customer relations, budget management, and community outreach.

INTRO TO COMPUTER PROGRAMMING (CP)		BC1017
ELECTIVE	Grade 12	*UC-approved "d, g"*

Recommendations: B- or above in Algebra I.

This course is geared towards students who want to gain skills in computer programming or get prepared for AP CS. No prior experience is required. This course is still suitable for students who have taken a coding elective in middle school.

Students will work with SNAP (a drag-and-drop programming language) to learn critical thinking, logic, and problem-solving skills and then with Java where they will apply their knowledge of algorithms to code in a written format. Concepts learned include variables, functions, 1D and 2D arrays, and object-oriented programming. The objectives of this course are that students will:

- Develop computer programming skills such as abstraction, logic, and algorithmic thinking.
- Develop projects using object-oriented principles.
- Become prepared for problem solving skills in the AP Computer Science course.
- Increase their awareness of computer science as a career and life skill.

AP COMPUTER SCIENCE		BA1010
MATHEMATICS	Grades 10-12	*UC-approved "c, g"*

Recommendations: Algebra II with concurrent enrollment in Trigonometry/Math Analysis.

The goals of the AP Computer Science are comparable to those in the introductory course for computer science majors offered in college and university computer science departments. It is not expected, however, that all students in the AP Computer Science will major in computer science at the university level. The AP Computer Science is intended to serve both as an introductory course for computer science majors and as a course for students who will major in other disciplines that require significant involvement with technology. It is not a substitute for the usual college-preparatory mathematics courses.

Students will be able to:

- Design and implement solutions to problems by writing, running, and debugging computer programs.
- Use and implement commonly used algorithms and data structures.
- Develop and select appropriate algorithms and data structures to solve problems.
- Code fluently in an object-oriented paradigm using the programming language Java. Students are expected to be familiar with and be able to use standard Java library classes from the AP Java subset.
- Read and understand a large program consisting of several classes and interacting objects. Students should be able to read and understand a description of the design and development process leading to such a program.
- Recognize the ethical and social implications of computer use.

ADEN – Advanced Data Structures and Embedded Systems and Networking		BC1030
ELECTIVE	Grades 11-12	*UC-approved "g"*

Recommendations: AP Computer Science or Teacher Approval.

ADEN builds upon the concepts and skills learned in AP Computer science. During the first semester, students will explore and use advanced data structures such as Queues, Trees, Maps, Hashes and Graphs, applying them to solve complex problems and evaluate performance tradeoffs of different implementations. Collaborative projects will provide opportunities to

develop experience with formal documentation, testing, and revision control. During the second semester, students will explore a variety of topics, including Embedded Systems, where they will use C and Assembly language to program a robot to autonomously navigate through several challenges, including controlling motors, reading sensors, implementing finite state machines and prioritizing interrupts and sampling intervals. In addition, students will explore different types of networks, understand network protocols and routing, router configuration and security concerns, and write software to access across a network.

ENGINEERING TECH I		KC1340
ELECTIVE	Grades 9-12	*UC-approved "d, g"*

Recommendations: B- or above in Algebra I.

In this class, students will dig deep into the engineering design process, practically applying math, science, and engineering standards. Students will engage in a deep dive into technical drawings and 3D modeling software (Fusion 360) to work both individually and in design teams to present solutions to posed challenges or problems. Students will begin to develop a personal portfolio that they can carry with them into their collegiate and professional careers. This class is focused on the application of 3D modeling, drawing, and digital design. Students will also apply basic physics concepts to learn about structural mechanics, material strength, and load conditions through force analysis. By the end of the year, students will be able to create complete digital assemblies in Fusion 360, demonstrating simulated interactions of components and visually accurate relative motion.

ENGINEERING TECH II		KC1350
ELECTIVE	Grades 10-12	*UC-approved "d, g"*

Recommendations: B- or above in Geometry, Engineering 1 completion or equivalent
This course relies heavily on CAD skills developed in Engineering I

Through project-based design challenges, students explore a broad range of engineering topics, including physical mechanisms and motion transfer systems, electrical circuits, and automation. Students develop skills in problem solving, research, and design while learning strategies for design process documentation, collaboration, and presentation. Students will learn how to properly test designs using data and statistical analysis to offer strong support for results and

claims of performance. The class relies heavily on the CAD skills in Fusion 360 that are developed in the Engineering 1 course.

DESIGN AND PROTOTYPING		BC2040
ELECTIVE	Grades 9-12	*UC-approved "g"*

Recommendations: B- or above in Geometry or Algebra II

To introduce students to the ideas of engineering and design through a prototyping process that begins with a problem and follows a standard engineering process of conceptualizing a solution, testing and re-testing of prototypes, and redesign of original concept.

Enrolled students will engage in computer aided design and modeling beginning in two dimensions and progressing to three dimensions. Students will not only learn the software behind 21st century design but also the hardware through hands-on experience with a laser cutting system, three dimensional printers, and computer numerically controlled router systems. Design software includes Adobe Illustrator, TinkerCAD, and Fusion 360. Students will engage in collaborative group projects with peers of varying skill levels and backgrounds to produce real products. The course teaches and follows a typical industry style prototyping process using the design thinking process, where much of the learning occurs through product component failure and re-design. Groups will design a solution to a design engineering challenge at the end of the year that is realized through the various media presented throughout the class.

DESIGN AND FABRICATION		BC2041
ELECTIVE	Grades 10-12	*UC-approved "g"*

Recommendations: B- or above in Geometry or Algebra II, and B- or above in Design and Prototyping

In this course students will continue to develop prototyping and fabrication skills using larger manual machines that provide the largest flexibility for product development. Students will work in varying sized groups to design and create full sized products that fit

within different assigned categories using modern design software, rapid prototyping machines and full scale wood and metal working tools. Students will be taught to safely use modern machine shop tools such as mills, lathes and routers to create full sized, working

prototypes. Students will be led through the process of creation from brainstorming ideas to building hand crafted finished products.

ROBOTICS I		BC2060
ELECTIVE	Grades 9-12	*UC-approved "g"*

An introductory course teaching the basics of engineering and the process of engineering design and the manufacturing process. Students will learn the foundational skills necessary for a competition robotics team: computer aided design, machining, assembly, code, basic physics, and electronics. Students will work in collaborative groups designing robots to address various engineering challenges. Students will be expected to attend a couple hours of one local competition each semester to experience the primary challenge of the second year Robotics 2 course.

ROBOTICS II		BC2061
ELECTIVE	Grades 10-12	*UC-approved "g"*

Recommendations: Robotics 1 completion or equivalent

A second year course for veteran robotics team members. This course is primarily focused on continuing skill development around the FIRST competition. In the fall, students will engage in off- season projects and rebuilds to improve and prepare for multiple off-season competitions. Veterans are expected to train new team members in skill development in preparation for build season in January and February. During build season veterans will lead design teams guiding other team members through components of the primary robot build. Students enrolled will automatically be considered part of FIRST Robotics Competition Los Altos Robotics Team 114 Eaglestrike and are expected to join the team at competition and devote significant time to engage in the primary robot build in January and February.

DIGITAL COMMUNICATIONS I		KC1300
PRACTICAL ART/ ELECTIVE	Grades 9-12	*UC-approved "g"*

Digital Communications I class is an introductory concentrator class to the CTE Digital Communications pathway. It introduces students to the core media literacy skills required to become critical consumers and active creators of the media that influences our collective understanding of the world. Key skills include:

- Reading and viewing both historically relevant and recently-published journalistic works, and engaging with the concepts of authorship, format, audience, content and purpose as the five pillars of media literacy.
- Creating your own text and non-text media, evaluating them according to the five pillars and against the standards set by professional journalists.
- Learning to conduct journalistic research.
- Understanding of journalistic industry standards like press law, data reporting and freedom of information requests.
- Viewing and producing non-print sources like podcasts and video packages.
- Improving and clarifying your journalistic writing style.

DIGITAL COMMUNICATIONS II/ YEARBOOK		KC1310
PRACTICAL ART/ ELECTIVE	Grades 10-12	*UC-approved "f"*

Prerequisites: Digital Com I or instructor approval.

This course is one of two capstone courses in the Digital Communication CTE pathway. Students will refine their creative and technical skills while preparing for careers in media production and communications across digital platforms.

- They will apply narrative structure in the journalistic process while producing Aerie, the school yearbook.
- Students will learn to tell impactful stories, demonstrate proficiency in industry-standard tools and software, and properly operate equipment for capturing, editing, designing, and publishing digital and print content.
- Pathway completers will develop a professional portfolio and understand the application of skills in workplace environments.

DIGITAL COMMUNICATIONS II/ TALON		KC1330
PRACTICAL ART/ ELECTIVE	Grades 10-12	*UC-approved "g"*

Prerequisites: Digital Communications I or instructor approval.

This is one of the two Capstone courses in the Digital Communications CTE pathway. Students will apply journalistic processes to the development and refinement of original audio and or visual content, learn how to capture and edit content for specific audiences, and how to

properly operate equipment for capturing, editing, broadcasting, and streaming content in different environments.

This course also produces the school newspaper, The Talon. Students will develop their creative and technical skills that prepare them for careers in media production and communications across digital platforms. They will learn about narrative structure and the journalistic process by telling impactful stories, and using industry standard state of the art software to do so.

CULINARY ARTS I		KC1012
PRACTICAL ART/ ELECTIVE	Grades 10-12	*UC-approved "g"*

This two-semester program with an additional second year of training available prepares students for food production, preparation and service employment in institutional, commercial or independently owned food establishments or other food and hospitality industry occupations. Instruction includes topics such as planning, selecting, storing, purchasing, preparing, testing, serving and selling of quality food. The program includes the basic skills of food service including sanitation, safety, methods of cooking, stocks, soups, sauces, methods of baking, pastry, banquet set up, catering, nutrition, and job preparation. Teaching methods include demonstration, laboratory, and textbook work. Students have an opportunity to cook both individually and in groups and to participate in planning meals. The full Serve-Safe curriculum and certification is a major emphasis of this course. During the second semester students are counseled to participate in "on the job training." On the job training may be completed at fast food restaurants, coffee shop operations, on-site food service, or in independent living retirement centers. This may be followed by actual employment at these sights. This experience has the potential to lead to actual employment opportunities.

CULINARY ARTS II		KC1013
PRACTICAL ART/ ELECTIVE	Grades 11-12	*UC-approved "g"*

Prerequisites: Culinary I or instructor approval.

This course prepares the student to work in the food service industry. The program prepares students with food production, preparation and service skills for employment in institutional, commercial or independently owned food establishments or other food and hospitality industry occupations. Instruction includes topics such as planning, selecting, storing, purchasing, preparing, testing, serving and selling of quality food and food products. Students are expected

to meet a higher level of performance in the quantity and quality of their assigned work. The students will learn intermediate level skills, both theoretical and practical, performed in the dining room and kitchen restaurant operations. Teaching methods include demonstration, laboratory and textbook work. Training areas covered in this course will include food service facilities and equipment; quality food purchasing and costing; health and safety regulations and practices; skills in food preparation and service and practical experience in such food service jobs. Integrated throughout the course are career preparation standards, which include basic academic skills, communication, interpersonal skills, problem solving, safety technology and other employment skills. State law dictates every food facility must have one or more certified employees.

Fashion Design I **** Proposed Course****

PRACTICAL ART/ ELECTIVE Grades 9-12 **Pending UC-approval "g"*

The course is currently awaiting approval from the MVLA School Board (as of 11/17/24)

Fashion Design I introduces and explores various aspects of fashion design. Instruction includes a brief history of fashion, elements of art and principles of design, fashion research and marketing, merchandising, patternmaking, garment construction, textiles, color theory, fashion croquis, and careers in the fashion industry. This course will be a base for the more advanced capstone course, Design II (Capstone). Students will do hands-on projects, such as researching, fashion drawings, hand and machine sewing, patternmaking, creating mood boards, and presentations.