

The Project Lead The Way (PLTW) Pre-Engineering: program prepares students for further education and careers in engineering and engineering technology. Students complete foundation-level courses in Engineering, including Introduction to Engineering Design, Principles of Engineering, Aerospace Engineering, and Computer Integrated Manufacturing. In the final course, students complete an industry-mentored capstone project in Engineering Design and Development. Students who qualify can earn transcripted credit at PLTW–affiliated colleges and universities nationwide, including the University of Maryland, Baltimore County.

The credit will be offered for those students who complete the entire PLTW Pre-Engineering sequence of courses with a B average, and score at least 7 on each end-of-course assessment.



Prerequisite Courses

Before entering the Pre-Engineering Program, student must have successfully completed the following courses at their home high school:

- Algebra I
- Introduction to Engineering and Design
- Principles of Engineering

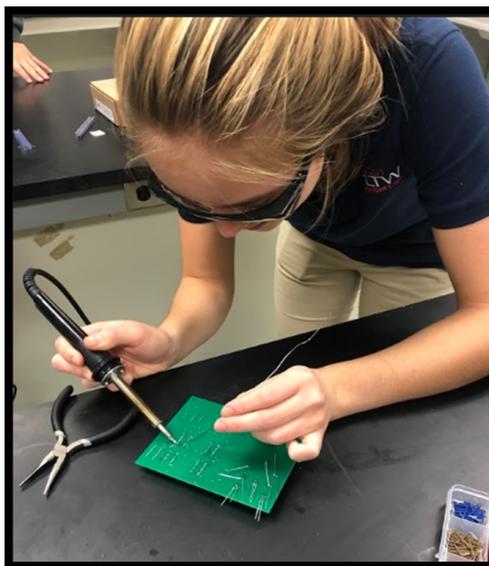
Program Fee

- Uniforms \$40

Students from the five county high schools have the opportunity to begin programs during their junior year by a designated application process. Students will complete their programs during their senior year.

Potential Careers

- Aerospace engineer
- Automotive engineer
- CAD technician
- Contracting civil engineer
- Control and instrumentation engineer
- Maintenance engineer
- Mechanical engineer
- Nuclear engineer

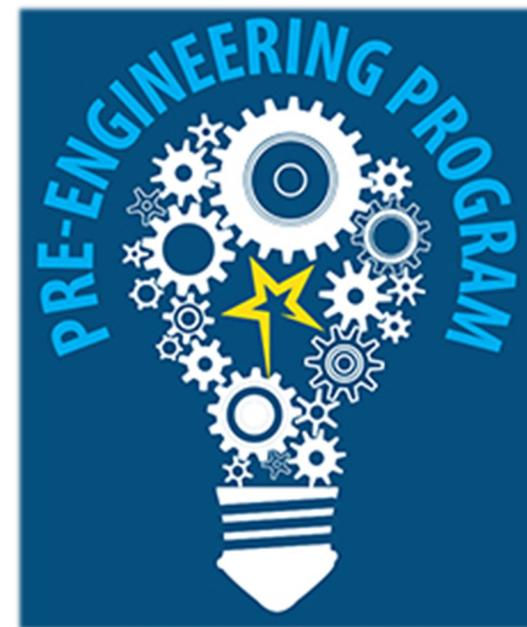


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Expect Success at CCST

Certifications, Citizenship, Skills & Technology

Revised 01/2021



**Cecil County
School of Technology
Cecil County Public Schools**

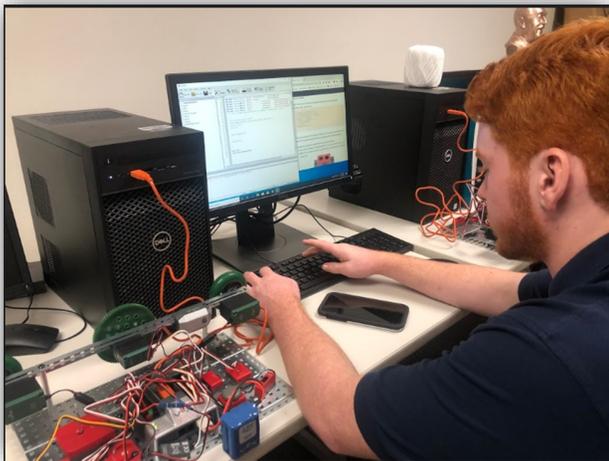


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Project Lead The Way Pre-Engineering

Each PLTW Engineering course engages students in interdisciplinary activities like working with a client to design a home, programming electronic devices or robotic arms, or exploring algae as a biofuel source. These activities not only build knowledge and skills in engineering, but also empower students to develop essential skills such as problem solving, critical and creative thinking, communication, collaboration, and perseverance.

Throughout the program, students step into the varied roles engineers play in our society, discover new career paths and possibilities, and develop engineering knowledge and skills. In addition, as students work in teams to design and test solutions, they're empowered to develop in-demand, transportable skills like collaboration, critical thinking, and communication.



Program Course Sequence

HONORS DIGITAL ELECTRONICS

Junior Year—First Semester

This course introduces students to applied digital logic, a key element of careers in engineering and engineering technology. Students study the application of electronic logic circuits and devices, and apply Boolean logic to the solution of problems. Using Circuit Maker, the industry standard, students test and analyze simple and complex digital circuitry. Students design circuits, export their designs to a printed circuit auto routing program that generates printed circuit boards, and construct the design using chips and other components.

HONORS AEROSPACE ENGINEERING

Junior Year—Second Semester

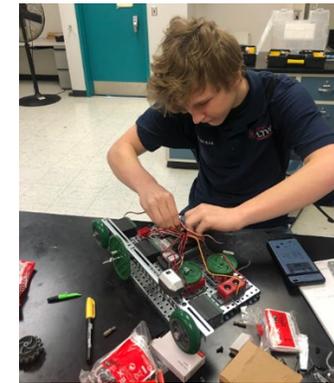
This course introduces students to the world of aeronautics, flight, and engineering. Students in this course will apply scientific and engineering concepts to design materials and processes that directly measure, repair, improve, and extend systems in different environments. The course deepens the skills and knowledge of an engineering student within the context of atmospheric and space flight. Students explore the fundamentals of flight in air and space as they bring the concepts to life by designing and testing components related to flight, such as airfoil, propulsion system, and a rocket. Students apply aerospace concepts to alternative applications such as a wind turbine and parachute. Students simulate a progression of operations to explore a planet, including creating a map of the terrain with a model satellite and using the map to execute a mission using an autonomous robot.

HONORS COMPUTER INTEGRATED MANUFACTURING (CIM)

Senior Year—All Year

This course teaches the fundamentals of computer manufacturing technology. It builds on the solid-modeling skills developed in previous courses of the program. Students use 3-D computer software to solve design problems. They assess their solutions through mass propriety analysis (the

relationship of design, function and materials), modify their designs, and use prototyping equipment to produce 3-D models. Students will use 3-D modeling software; understand the operating procedures and programming capabilities of machine tools Computer Numerical Control (CNC) Equipment; convert computer-generated geometry into a program to direct the operation of CNC machine tools; program robots to handle materials in assembly-line operations (Robotics); and work in teams to design manufacturing work cells and tabletop factories to solve complex problems that arise in integrating multiple pieces of computer-controlled equipment.



HONORS ENGINEERING DESIGN & DEVELOPMENT

Senior Year—All Year

This course enables students to apply what they have learned in academic and pre-engineering courses as they complete a challenging self-directed project. Students work in teams to design and build solutions to authentic engineering problems. An engineer from the program's partnership team mentors each student or team. At the end of the course, individuals or teams present their research paper and defend their projects to a panel of engineers, business leaders, and engineering college educators for professional review and feedback. This course equips students with the independent study skills they will need in post-secondary education, and careers in engineering and engineering technology.