

PRE-ENGINEERING ACADEMY

Curriculum Information

Pre-Engineering Academy Program Goal

The goal of the four-year program of study is to provide an overview of engineering and engineering technology. Students use problem-solving skills to tackle real-world engineering problems. Hands-on opportunities with computers and project simulations help students to understand technical concepts.



Project Lead the Way (PLTW) is an engaging and thought provoking curriculum through which students develop critical thinking skills through hands-on project-based learning, preparing them to take on real-world challenges.

Foundation Courses

PLTW Introduction to Engineering Design (Advanced)

Students are exposed to the design process, research and analysis, global and human impacts, communication methods, engineering standards and technical documentations. They use 3D solid modeling design software to design solutions to solve proposed problems. Students will make presentations explaining their solutions.

PLTW Principles of Engineering (Advanced)

Students employ engineering and scientific concepts in the solution of engineering design problems. They develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges. Student document their work and communicate solutions to peers and members of the professional community.

PLTW Digital Electronics (Advanced) Digital Electronics touches our lives on a daily basis. It is the foundation of all modern electronic devices such as cellular phones, MP3 players, laptop computers, digital cameras and high definition televisions.



It is essential for anyone in a technical field to have a basic understanding of how digital systems, sensors and controls work. Students focus on the process of combinational and sequential logic design, methods, engineering standards and technical documentation.

Specialized Courses

Computer Integrated Manufacturing (Advanced) How are things made? What processes go into creating products? Is the process for making a water bottle



the same as it is for a musical instrument? How has automation changed manufacturing? While students discover the answers to these questions they are learning the history of manufacturing, robotics, computer modeling, automation, manufacturing processes, and flexible manufacturing systems.

PLTW Aerospace Engineering (Advanced)

Students explore the evolution of flight, navigation and control, flight fundamentals, aerospace materials, propulsion, orbital mechanics and space travel. Students work in teams utilizing hands-on activities.



PLTW Civil Engineering and Architecture (Advanced) Students apply what they learn about various aspects of civil engineering and architecture to the design and development of a property.



Students use 3D design software to design and document solutions for major course projects.

Capstone Project

PLTW Engineering Design and Development (Honors) Students work in teams to research, design, test and construct a solution to an open-ended engineering problem.

The product development life cycle and a design process are used to guide and help the team to reach a solution. Teams present and defend their solution to a panel of outside reviewers at the conclusion of the course.

College Advantage

Whether a student plans to attend a four-year university or two-year associate program CATA offers all the required subjects necessary for post-secondary education. Many required courses in the Pre-Engineering Academy carry honors credit. Advanced Placement (AP) opportunities also exist within the core curriculum. Successful completion of Honors and/or AP courses can boost a student's GPA.

Work-based Learning Opportunities

Partnerships with the business community have been developed to allow qualified students in the Pre-Engineering Academy to participate in job shadowing, internship or cooperative learning experiences.

CENTRAL ACADEMY OF TECHNOLOGY & ARTS



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