

## **Technology Education**

All Technology classes have a \$10.00 fee per semester.

**Project Lead the Way** is a series of courses that is offered nationwide to promote careers in engineering and connect math and science courses to technology in a more high-tech project-oriented environment. This series of classes is designed around the use of a computer in engineering products, solving problems, and developing skills in engineering communication.



Many students discover a high degree of interest in this field which offers a large number of employment opportunities. With more than half of the engineers and scientists in the United States nearing retirement, a future need will exist for more than a million engineers and technical workers.

### ***Introduction to Engineering and Design (PLTW) (9-12) CCC***

This introductory course develops student problem solving skills, with emphasis placed upon the concept of developing a 3-D model or solid rendering of an object. Students focus on the application of visualization processes and tools provided by modern, state-of-the-art computer hardware and software. Inventory will be the primary software used. This modern computer-based process replaces the traditional hand drawing methods. Various design applications will be explored with discussion of possible career opportunities. (Prerequisite: Algebra I – may be taken concurrently.)

### ***Principles of Engineering (PLTW) (10-12) CCC***

This year long, two semester course is designed to help students understand the field of engineering/engineering technology by exploring various technology systems and manufacturing processes. Students learn how engineers and technicians use math, science, and technology in an engineering process to benefit people. Students will develop critical thinking skills and problem solving skills through instructional activities that pose design and application challenges for which they develop solutions. The techniques learned and equipment used are state of the art and reflect equipment and processes used currently by engineers throughout the United States. (Prerequisite: Algebra I – may be taken concurrently) POE is a Core 40 directed elective as a part of a technical career area and qualifies as an Academic Honors or Technical Honors Diploma.

### ***Engineering Design and Development (PLTW) (12) CCC***

Engineering Design and Development is designed to introduce students to the fundamental aspects of engineering and engineering technology. Instruction will emphasize underlying principles of engineering processes and the development of three-dimensional solid models. Instructional activities will build skills ranging from sketching simple geometric shapes to applying a solid modeling computer software package. Students will develop critical thinking and problem-solving skills through instructional activities that pose design and application challenges for which they develop solutions. The techniques learned and the equipment used should be state of the art and reflect equipment and processes currently being used by engineers throughout the United States. (Prerequisites: Introduction to Engineering Design, Principles of Engineering, and Digital Electronics. A senior who has completed IED and POE but has not completed Digital Electronics must complete an application and have it approved by the course instructor prior to enrollment.)

### ***Introduction to Construction***

Introduction to Construction is a course that will offer hands-on activities and real world experiences related to the skills essential in residential, commercial and civil building construction. During the course students will be introduced to the history and traditions of construction trades. The student will also learn and apply knowledge of the care and safe use of hand and power tools as related to each trade. In addition, students are introduced to blueprint reading, applied math,

basic tools and equipment, and safety. Students will demonstrate building construction techniques, including concrete and masonry, framing, electrical, plumbing, dry walling, HVAC, and painting as developed locally in accordance with available space and technologies. Students learn how architectural ideas are converted into projects and how projects are managed during a construction project in this course. Students study construction technology topics such as preparing a site, doing earthwork, setting footings and foundations, building the superstructure, enclosing the structure, installing systems, finishing the structure, and completing the site. Students also investigate topics related to the purchasing and maintenance of structures, special purpose facilities, green construction and construction careers.

### ***Introduction to Design Processes***

Introduction to Design Processes is a one-semester course that specializes in modern design and engineering processes with a focus on creative problem solving in developing, testing, communicating, and presenting post-evaluation of products. Students use the design process to analyze research, develop ideas, and produce products solutions. This process gives a framework through which they design, manufacture tests present their ideas. Students will demonstrate and utilize design principles and elements for visual presentation. Designing aspects will also cover aesthetics, ergonomics, the environment, safety, and production. The design process is a core-learning tool for many courses enabling the student to solve problems in a systematic, logical and creative manner. Students develop a good understanding of the way the process helps them think creatively and developing aesthetic ideas. The design process encourages the students to engage in higher level thinking to create solutions to many problems

### ***Introduction to Manufacturing***

Introduction to Manufacturing is a course that specializes in how people use modern manufacturing systems with an introduction to manufacturing technology and its relationship to society, individuals, and the environment. An understanding of manufacturing provides a background toward developing engineering & technological literacy. This understanding is developed through the study of the two major technologies, material processing and management technology, used by all manufacturing enterprises. Students will apply the skills and knowledge of using modern manufacturing processes to obtain resources and change them into industrial materials, industrial products and consumer products. Students will investigate the properties of engineered materials such as: metallic; polymers; ceramics; and composites. After gaining a working knowledge of these materials, students will study six major types of material processes: casting and molding; forming; separating; conditioning; finishing; and assembling.