

## **MALDEN CATHOLIC**

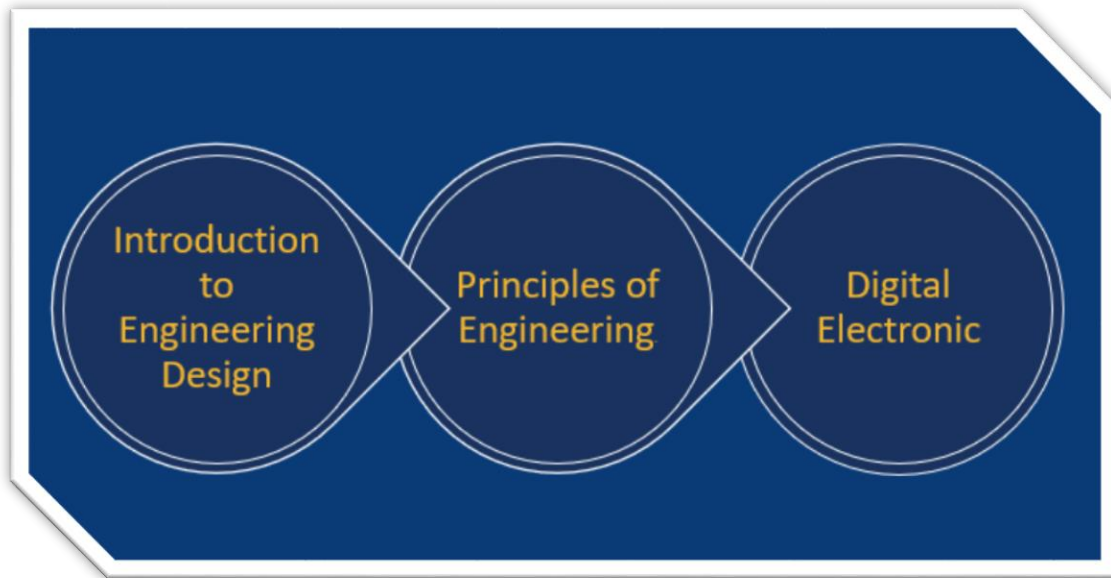


## **PROJECT LEAD THE WAY ENGINEERING**

### **PROGRAM DESCRIPTION**

PLTW Engineering empowers students to step into the role of an Engineer, adopt a problem-solving mindset, and make the leap from dreamers to doers. The program's courses engage students in compelling, real-world challenges that help them become better collaborators and thinkers. Students take from the course in-demand knowledge and skills they will use in high school, college, and the rest of their lives, on any career path they take. Malden Catholic is one of the only schools in the major metropolitan area to offer PLTW courses that engage students in compelling, real-world challenges that allow them to step into the role of an engineer with a problem-solving mindset and determine functional solutions.

### **PROJECT LEAD THE WAY PATHWAY AT MC**



### **INTRODUCTION TO ENGINEERING DESIGN (1 credit, honors)**

Ideally taken during sophomore year, Introduction to Engineering Design (IED) is a high school level course that is appropriate for students who are interested in design and engineering. The major focus of the IED course is to expose students to design process, research and analysis, teamwork, communication methods, global and human impacts, engineering standards, and technical documentation. IED gives students the opportunity to develop skills and understanding of course concepts through activity-, project-, and problem-based (APPB) learning. Used in combination with a teaming approach, APPB-learning challenges students to continually hone their interpersonal skills, creative abilities and understanding of the design process. It also allows students to develop strategies to enable and direct their own learning, which is the ultimate goal of education.

The course assumes no previous knowledge, but students should be concurrently enrolled in college preparatory mathematics and science. Students will employ engineering and scientific concepts in the solution of engineering design problems. In addition, students use the most current issued 3D solid modeling design software package to help them design solutions to solve proposed problems. Students will develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges that increase in difficulty throughout the course. Students will also learn how to document their work and communicate their solutions to their peers and members of the professional community.

Introduction to Engineering Design is one of three foundation courses in the Project Lead The Way high school pre-engineering program. The course applies and concurrently develops secondary level knowledge and skills in mathematics, science, and technology.

### **PRINCIPLES OF ENGINEERING (1 credit, honors)**

Principles of Engineering (POE) is a high school-level survey course of engineering. The course exposes students to some of the major concepts that they will encounter in a post-secondary engineering course of study. Students have an opportunity to investigate engineering and high-tech careers. POE gives students the opportunity to develop skills and understanding of course concepts through activity-, project-, and problem-based (APPB) learning. Used in combination with a teaming approach, APPB learning challenges students to continually hone their interpersonal skills, creative abilities, and problem-solving skills based upon engineering concepts. It also allows students to develop strategies to enable and direct their own learning, which is the goal of education.

To be successful in POE, students should be concurrently enrolled in college preparatory mathematics and science. Students will employ engineering and scientific concepts in the solution of engineering design problems. Students will develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges. Students will also learn how to document their work and communicate their solutions to their peers and members of the professional community.

Principles of Engineering is the second of two foundation courses in the Project Lead The Way high school engineering program. The course applies and concurrently develops secondary level knowledge and skills in mathematics, science, and technology. This course is recommended to be taken after successful completion of PLTW-Introduction to Engineering

### **DIGITAL ELECTRONICS (1 credit, honors)**

Digital Electronics is the study of electronic circuits that are used to process and control digital signals. In contrast to analog electronics, where information is represented by a continuously varying voltage, digital signals are represented by two discrete voltages or logic levels. This distinction allows for greater signal speed and storage capabilities and has revolutionized the world electronics. Digital electronics is the foundation of all modern electronic devices such as cellular phones, MP3 players, laptop computers, digital cameras, high-definition televisions, etc.

The major focus of the DE course is to expose students to the design process of combinational and sequential logic design, teamwork, communication methods, engineering standards, and technical documentation. Utilizing the activity-project-problem-based (APPB) teaching and learning pedagogy, students will analyze, design and build digital electronic circuits. While implementing these designs students will continually hone their interpersonal skills, creative abilities and understanding of the design process. Digital Electronics (DE) is a high school level course that is appropriate for 11<sup>th</sup> or 12<sup>th</sup> grade students interested in electronics. Other than their concurrent enrollment in college preparatory mathematics and science courses, this course assumes no previous knowledge. Digital Electronics <sup>TM</sup> is one of three foundation courses in the Project Lead The Way® high school pre-engineering program. The

course applies and concurrently develops secondary level knowledge and skills in mathematics, science, and technology.