QUINCE ORCHARD HIGH SCHOOL
PROJECT LEAD THE WAY
PLTW

PLTW DISTINGUISHED SCHOOL HIGH SCHOOL 2017-18

High school students involved in PLTW strive to complete a minimum of three foundation courses, one specialization course, and the capstone course. The Pathway to Engineering system works in any standard four-year sequence and prepares students for two- or four-year college studies in engineering and E/T by exposing them to the true scope of the field. Most courses can earn course credit at accredited colleges and universities and some of the courses satisfy the State of Maryland Technology Credit for Graduation.

Information on how to fit these courses within the four years of high school while taking other challenging courses is available on our website – www.qohs.org > Counseling > QO Bulletin Page in the "Planning Coursework" areas. Additional details about PLTW are also available on the website on the PLTW page and you can contact any of the teachers below or Mrs. Adams (colleen_m_adams@mcpsmd.org).

Foundation Courses

Introduction to Engineering Design – IED *College Credit Option | MD Tech Credit*

This is the introductory course for PLTW which focuses on the design process and its application while students learn to use 3D modeling software and work in teams. Students dig deep into the engineering design process, applying math, science, and engineering standards to hands-on projects. They work both individually and in teams to design solutions to a variety of problems using 3D modeling software, and use an engineering notebook to document their work. This course is designed for 9th and 10th grade students.

- Pre-requisites: Completion of Algebra 1 with a grade of "C" or better
- Teachers: Mr. Castillo (mario_e_castillo@mcpsmd.org) and Mr. Sontz (derek_s_sontz@mcpsmd.org)

Principles of Engineering – POE *College Credit Option | MD Tech Credit*

This second year course explores a variety of topics including mechanisms, energy, statics, materials, and kinematics while developing and applying problem-solving skills. Through problems that engage and challenge, students explore a broad range of engineering topics, including mechanisms, the strength of structures and materials, and automation. Students develop skills in problem solving, research, and design while learning strategies for design process documentation, collaboration, and presentation. In addition to practical engineering applications, students also learn about various engineering career fields as well as conduct a personal interview of an engineer working in their field of interest. This course is designed for 10th and 11th grade students.

- Pre-requisites: Completion of IED
- Teacher: Mr. Sarjeant (Omari_R_Sarjeant@mcpsmd.org)

Digital Electronics – DE *College Credit Option*

This is the third course in the series which focuses on using combinational and sequential logic design and their use as the foundation for all modern electronic devices. From smart phones to appliances, digital circuits are all around us. This course provides a foundation for students who are interested in electrical engineering, electromechanical engineering, electronics, or circuit design. Students study topics such as combinational and sequential logic and are exposed to circuit design tools used in industry, including logic gates, integrated circuits, and programmable logic devices. This course is designed for 10th, 11th, and 12th grade students.

- Pre-requisites: Completion of IED and POE
- Teacher: Mr. Castillo (mario_e_castillo@mcpsmd.org)

IED, POE, and DE are all required courses as part of the Maryland State Department of Education Project Lead the Way Pathway.

Specialization Courses

Aerospace Engineering - AE *College Credit Option*
This is one of the fourth course options, it propels students' learning in the fundamentals of atmospheric and space flight. As they explore the physics of flight, students bring the concepts to life by designing an airfoil, propulsion system, and rockets. They learn basic orbital mechanics using industry-standard software. They also explore robot systems through projects such as remotely operated vehicles. This course is designed for 11th and 12th grade students.

- Pre-requisites: Completion of IED and POE and completion of or enrollment in DE
- Teachers: Mr. Sontz (derek_s_sontz@mcpsmd.org)

Environmental Sustainability - ES *College Credit Option*
This is one of the fourth course options, it has students investigate and design solutions in response to real-world challenges related to clean and abundant drinking water, food supply issues, and renewable energy. Applying their knowledge through hands-on activities and simulations, students' research and design potential solutions to these true-to-life challenges. This course is designed for 11th and 12th grade students.

- Pre-requisites: Completion of IED and POE and completion of or enrollment in DE
- Teachers: Ms. Haase (deborah_p_haase@mcpsmd.org)

Capstone Course - Engineering Design and Development - EDD
This is the fifth course in the series where the knowledge and skills students acquire throughout PLTW Engineering come together in EDD as they identify an issue and then research, design, and test a solution, ultimately presenting their solution to a panel of engineers for evaluation. Students apply the professional skills they have developed to document a design process to standards and by completing EDD are better prepared to take on any post-secondary program or career. Student projects and proposals are evaluated by a panel of Engineers at the end of the course. This course is designed for 12th grade students.

- Pre-requisites: Completion of IED and POE and it is recommended to have completion of either DE or AE/ES (Most students will take AE/ES and EDD in the same school year)
- Teacher: Mr. Sarjeant (Omari_R_Sarjeant@mcpsmd.org)

Outside the Classroom

The PLTW Program also offers a variety of additional support and ways to get involved at QO.

Clubs and Organizations:

- Engineering Club – this club competes in the FIRST Robotics competitions with two different teams and explores the use of 3-D printers, drones and other fascinating technology and engineering opportunities.
- Women in Engineering Club – this club serves a place for female engineering students to meet and discuss issues, listen to guest speakers, and work on getting more girls involved in engineering.
- National Technical Honor Society – PLTW students who have completed or are completing their third PLTW course with at least a 3.25 GPA in their PLTW courses and a 3.0 overall GPA are eligible to apply. The honor society offers special scholarships for members as well as weekly tutoring opportunities for other PLTW students.

Other Activities and Opportunities:

- Guest speakers are regularly brought into the PLTW courses to speak about engineering in the workplace, different career paths, and different areas of interest and to help make connections for current student work to real-life careers.
- "Chat and Chew" sessions provide students an opportunity to sit down with actual engineers who are currently working in different careers and ask them questions and network with them during lunch sessions at school.
- Workshops are offered to PLTW students on a variety of subjects including:
    - Professionalism
    - Resumes – students learn what is necessary for a good resume and have the chance to have their resume reviewed and critiqued by a panel or engineers and then sit down with those engineers to discuss their resume.
    - Interviews – students learn what the keys to success are for being in an interview and have the opportunity to participate in a mock interview with a panel of engineers for an actual career.