Engineering Academy/Technical Education Requirement

Technology Education courses offer students instruction in a variety of areas which may be of interest to life experiences or may lead to a profession related to technology and engineering. Basically, students take a technology course for two main reasons: (1) to gain the foundation for seeking further education in an engineering field (via Whitman's Engineering Academy) and/or (2) to fulfill the technology education graduation requirement.

Tech Ed Requirement

There are three courses that will satisfy the state mandated requirement for the one credit of technology education needed for graduation: (1) Introduction to Engineering Design (IED), (2) Principles of Engineering (POE), and (3) Foundations of Technology (FOT). A student only needs to take and pass one of these to satisfy the basic technology education credit for graduation.

The Foundations of Technology course is not taught at Whitman; however, it is offered as a MCPS eLearning, online course. There is a tuition fee for this one credit course. The online FOT course has three required face-to-face lab sessions. Summer registration opens in early January; dates can fill quickly. For more information and to access registration materials go to http://www.montgomeryschoolsmd.org/departments/onlinelearning/courses_fot.shtm.

Please consult the course bulletin for course descriptions and availability at http://apps.montgomeryschoolsmd.org/coursebulletin/.

Important considerations when choosing between IED, POE or FOT:

- FOT does not have a math prerequisite, whereas IED or POE is taken after completion of Algebra I.
- IED and POE satisfy certain prerequisites to taking an advanced level Engineering course; however, FOT will not satisfy such a prerequisite.
- IED and POE are college level courses that are part of the Project Lead the Way (PLTW) curriculum; FOT is not a PLTW course. POE is honors level and grade weighted.
- Pyle Middle School offers the IED course.

A student that wants to fulfill the tech ed requirement, but does not intend on taking further technology or engineering courses, may be more interested in taking the Introduction to Engineering Design course at Whitman, or the online Foundations of Technology course during the summer. A student who is strong in math that wants to fulfill the tech ed requirement (and not take further engineering courses) may be more interested in the Principles of Engineering Course.

About IED: The main focus of the Introduction to Engineering Design is design. A student gets well versed in using Engineering CADD (Computer Aided Drafting and Design) software. The CADD Software used in IED is Inventor 2009. In IED, students learn to draw and sketch simple to complex stagnate objects or components. Students apply higher-level mathematics specific to Algebra I and Geometry I. Students may be eligible for college credit upon completion of IED.

About POE: The Principles of Engineering course focuses on the various fields of engineering itself. POE is an Advanced Level course that requires higher level math skills. Students can take POE without taking IED first. Algebra I and Geometry concepts are used throughout this course.

Comprehensive lists of electives as well as detailed course descriptions can be found in the Whitman Course Bulletin. Students should consult with their counselors when making course scheduling decisions.

Engineering projects in POE relate to the various engineering fields; for example, bridge and structure design projects and testing relate to civil and materials engineering, and robotics and automation projects related to systems and mechanical engineering. POE also covers electrical engineering concepts. Students may be eligible for college credit upon completion of POE.

Whitman's Engineering Academy

Project Lead The Way (PLTW) is an advanced engineering career pathway also referred to as Pathway To Engineering™. It is a national program that prepares students to be innovative and productive leaders in Science, Technology, Engineering, and Mathematics. PLTW's Pathway To Engineering™ program offers a dynamic high school program that provides students with real-world learning and hands-on experience. Students interested in engineering, biomechanics, aeronautics, and other applied math and science arenas may find that PLTW® is a portal into these industries. The program is a four-year course of study that is integrated into a high school student's core curriculum. The combination of traditional math and science courses with PLTW courses prepares students for college majors in engineering and technology and offers them the opportunity to earn college credit while still in high school. PLTW courses employ a combination of activities-based, project-based, and problem-based learning. (Please see Tables 1 and 2.)

The PLTW Engineering Academy at Whitman offers five courses that fulfill the Pathway to Engineering requirements: (1) IED; (2) POE; (3) Digital Electronics (DE); (4) Civil Engineering & Architecture (CEA); and (5) the capstone course, Engineering Design and Development (EDD). Course descriptions can be found online at:
http://apps.montgomeryschoolsmd.org/coursebulletin/CourseLists/Index/222
The PLTW recommended coursework is listed at:
http://www.montgomeryschoolsmd.org/departments/cte/toolkit/ClusterInfo/Engineering/prog_pltw.pdf

This PLTW program offers 5 high school credits total, which may earn students up to 3 college credits each or 15 total transcripted credits. These courses are typically taken in the following sequence:

Table 1: PLTW Required Coursework

Grade	PLTW Courses
9	IED or POE
10	IED or POE
11	DE and/or CEA
12	EDD

For information concerning Whitman's Engineering Academy and PLTW program, please contact Whitman's Resource Teacher for Technology Education:
Rachel Stender (Rachel_A_Stender@mcpsmd.org).

Comprehensive lists of electives as well as detailed course descriptions can be found in the Whitman Course Bulletin. Students should consult with their counselors when making course scheduling decisions.

Table 2: Summary of MCPS Technology / Engineering Courses

Technology Course Name		Course #	Tech Ed requirement for graduation (2012+)?	Grade Level	Prerequisite	Corequisite	Requirement for taking an Advanced Technology class?	PLTW course?	Required to for PLTW Program?	Honor or Adv. Level Course?	Offered at WWHS 2011-2012?
Introduction to Engineering Design A/B	IED	(5152/5153)	Yes	9-10-11-12	Algebra 1 preferred	Concurrent college prep math course	Yes	Yes	Yes	No	Yes
Principles of Engineering A/B	POE	(5150/5151)	Yes	10-11-12	Algebra I minimum; Algebra 2 preferred	Concurrent college prep math sequence	Yes	Yes	Yes	Yes	Yes
Foundations of Technology	FOT	5161/5162	Yes	9-10-11-12	None	None	No	No	No	No	No – online summer 2010
Digital Electronics A/B	DE	5156/5157	No	10-11-12	POE or IED; both POE and IED preferred	Requires a solid understanding of higher levels of mathematics. (All circuitry-based projects that use a lot of the logic taught in higher math.)	No	Yes	Yes	No	Yes
Civil Engineering & Architecture A/B	CEA	4255/4256	No	9-10-11-12	IED or POE; Both POE and IED preferred	Intended for students in PLTW advanced engineering career pathway	No	Yes	Yes	Yes	Yes
Engineering Design & Development A/B	EDD	5158/5159	No	12	POE + IED + at least one of DE or CEA	Concurrent college prep math sequence	No	Yes	Yes	Yes	Yes

Comprehensive lists of electives as well as detailed course descriptions can be found in the Whitman Course Bulletin. Students should consult with their counselors when making course scheduling decisions.