

## COMPLETER: [Engineering Technology](#) - Project Lead the Way Endorsement

CREDITS: 5

### Guideline for Course Selections

- Refer to Graduation Requirements in the Program of Studies for specific course requirements in each content area

Grade →	9	10	11	12
Exact scheduling depends on student's plan and school's master schedule.	English 9 (1)	English 10 (1)	❖ AP Language and Composition	English 12 (1)
	US Government (1)	US History (1)	World History (1)	
	Conceptual Physics (1)	Chemistry (1)	Biology (1)	
	Algebra I (1)	Geometry (1)	Algebra II (1)	Higher Level Math (1)
	PE (.5) / Health (.5)		PE (.5) / Financial Literacy (.5)	
	Fine Arts (1)	Foundations of Technology (1)		
	World Language (1)	World Language (1)		
<b>Completer Program Requirements</b>			Honors Principles of Engineering (1) Intro to Engineering Design (1)	Computer Integrated Manufacturing (1) Digital Electronics (1) Honors Engineering Design & Development (1)
<b>Program Specific Requirements</b>	A college preparatory math and science course is required each year of high school. See chart above.			
<b>Career Specific Electives</b> (may be taken any year offered after prerequisites have been satisfied)	❖ Recommended AP Connections: AP Calculus AB (1), AP Physics I (1) AP Statistics (1), AP Calculus BC (1), Trig & Pre-Calculus or Honors Trig. & Pre-Calc (1), Science Research I, II (1 ea.) AP Chemistry (1), Advanced Design Applications (1), Technological Design (1), Technological Issues & Impacts (1)			
8 credits possible per year				
<b>Value Added:</b>	16 Transcribed Credits	3 Articulated Credits	3 Articulated credits	3 credits
<b>From:</b>	Rochester Institute of Technology	University of Maryland Baltimore County	The Community Colleges of Baltimore County	Frederick CC
<b>Program:</b>	Engineering	Engineering	Engineering Technology & Engineering Transfer	CAD
<b>End of Program Test:</b>	Rochester Institute of Technology Exams in Principles of Engineering, Introduction to Engineering Design, Digital Electronics, & Computer Integrated Manufacturing			
<b>Industry:</b>	Project Lead the Way (PLTW)			
<b>Taken:</b>	At the end of the designated course			

See next page for junior program descriptions



## ENGINEERING – PROJECT LEAD THE WAY – Four Credit Completer

### **PRINCIPLES OF ENGINEERING**

Course: 540119 (Transcripted) 1 credit

This course provides an overview of engineering and engineering technology. Students develop problem-solving skills with real-world engineering problems. Through theory and practical hands-on experiences, students address the emerging social and political consequences of technological change. Topics include perspectives of engineering, design process, communication and documentation, engineering systems, materials and materials testing, thermodynamics, engineering for quality and reliability, and dynamics.

Prerequisites and other notes: This course is part of the Engineering completer program. Geometry is recommended as a prerequisite or may be taken concurrently. Students can take the college level exam at the end of this course. Students who successfully complete this course and the final exam may apply for transcripted credit from Rochester Institute of Technology (RIT) and University of Maryland Baltimore County (UMBC).

### **INTRODUCTION TO ENGINEERING DESIGN**

Course: 540019 (Transcripted) 1 credit

This class is a part of the Project Lead The Way Engineering Completer Program. This course emphasizes the development of a design. Students use computer software to produce, analyze, and evaluate models of project solutions. Students study the design concepts of form and function and use technology to translate conceptual design into reproducible products. Topics include application of the design process for problem-solving in a team setting, interpretation of sketches to design models, use of mass property calculations to evaluate a parametric model, and cost analysis, quality control, staffing, and packaging for product marketing.

Prerequisites and other notes: Geometry is the recommended prerequisite or may be taken concurrently. This course is part of the Engineering completer program. Students can take the college level exam at the end of this course. A math and science course is required in each year of high school. Students who successfully complete this course and the final exam may apply for transcripted credit from Rochester Institute of Technology (RIT) and University of Maryland Baltimore County (UMBC).

See next page for senior program descriptions

### **COMPUTER INTEGRATED MANUFACTURING**

Course: 557819 (Transcripted) 1 credit

This class is a part of the Project Lead The Way Engineering Program. Using solid modeling techniques, this course teaches the fundamentals of computerized manufacturing technology. Students use 3-D computer software to solve design problems. They assess their solutions through mass property analysis, modify their designs, and use prototyping equipment to produce 3-D models.

The course includes computer modeling, computer numerical control, computer-aided manufacturing robotics, and the use of flexible manufacturing systems.

Prerequisites and other notes: Introduction to Engineering Design and Principles of Engineering are prerequisites Algebra II or higher is recommended as a prerequisite or may be taken concurrently. A math and science course is required in each year of high school. This course is part of the Engineering completer program. Students can take the college level exam at the end of this course. Students who successfully complete this course and the final exam may apply for transcripted credit from Rochester Institute of Technology (RIT) and University of Maryland Baltimore County (UMBC).

### **DIGITAL ELECTRONICS**

Course: 558219 (Transcripted) 1 credit

This class is a part of the Project Lead The Way Engineering Program. This course introduces students to applied digital logic, a key element of careers in engineering and engineering technology. This course explores the smart circuits found in the electronics we use on a daily basis. Students use industry-standard computer software in testing and analyzing digital circuitry. They design circuits to solve problems, export their designs to a printed circuit auto-routing program, and use appropriate components to build their designs. Topics include analog and digital fundamentals, number systems and binary addition, logic gates and functions, Boolean algebra and circuit design, decoders, multipliers, and demultipliers.

Prerequisites and other notes: Principles of Engineering, Introduction to Engineering Design, and Algebra II or higher are recommended as prerequisites or may be taken concurrently. A math and science class is required in each year of high school. This course is part of the Engineering completer program. Students can take the college level exam at the end of this course. Students who successfully complete this course and the final exam may apply for transcripted credit from Rochester Institute of Technology (RIT) and University of Maryland Baltimore County (UMBC).

### **HONORS ENGINEERING DESIGN AND DEVELOPMENT**

Course: 540218 (Honors) 1 credit

This class is the capstone course of the Project Lead The Way Engineering Completer Program. Students will apply what they have learned in academic and prior Project Lead The Way courses as they complete challenging, self-directed projects. Students work in teams to design and build solutions to authentic engineering problems. A community partner engineer will mentor and consult with the teams. Students keep journals of notes, sketches, calculations, and research. Teams present final research papers and defend their projects to an expert panel.

Prerequisites and other notes: Computer Integrated Manufacturing, Digital Electronics, and Trigonometry/Pre-Calculus or higher are recommended as a prerequisite or may be taken concurrently. A math and science class is required in each year of high school. This course is part of the Engineering completer program.