MISSION

The mission of the Office of Technology Education and Information Technology is to ensure all students are technologically literate. Technological literacy will enable students to become life long learners who are effective and contributing members of society. The development of technological literacy focuses on knowledge, understandings and appreciations pertaining to technology, its evolution and societal significance, and the interrelationship of people, capital, knowledge, time, tools, materials, and machines in technology processes and systems.

Our office oversees the following instructional areas:

**Technology Education** is an integrated, experience-based instructional program designed to prepare students to be knowledgeable about technology - its evolution, systems, technologies, utilization, and social and cultural significance. It results in the application of mathematics and science concepts to technological systems in areas such as, but not limited to: construction, manufacturing, communications, transportation, biotechnology, and power and energy.

**Information Technology** encompasses all forms of technology used to create, store, exchange and utilize information in its various forms including business data, conversations, still images, motion pictures, and multimedia presentations.

**Engineering** is the application of science to the needs of humanity. This is accomplished through the application of knowledge, mathematics, and practical experience to the design of useful objects or processes. Professional practitioners of engineering are called engineers.

Courses Meeting the Required Technology Education Graduation Credit

The following is a listing of Baltimore County Public Schools courses approved to meet the Maryland Technology Education Graduation Requirement.

Note: (H) denotes Honors Level - (GT) denotes Gifted & Talented Level

<table>
<thead>
<tr>
<th>Course No.:</th>
<th>Course Title</th>
<th>Credit</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>55.1250.0</td>
<td>Introduction to Engineering and Tech Concepts</td>
<td>1</td>
<td>Designed for grade 9-12 students</td>
</tr>
<tr>
<td>55.3500.4</td>
<td>Engineering Principles and Applications (H)</td>
<td>1</td>
<td>Designed for grade 10 - 12 students enrolled in Chemistry and Geometry or above</td>
</tr>
<tr>
<td>55.3500.5</td>
<td>Engineering Technology (GT)</td>
<td>1</td>
<td>Designed for grade 11 or 12 students enrolled in Physics and College Algebra or above</td>
</tr>
</tbody>
</table>

Not all courses are offered at all schools.
Note: A = Meets Advanced Technology Education Requirement; T = Meets Basic Technology Education Requirement

Technology Education Graduation Requirement Courses

**Introduction to Engineering and Tech Concepts**
*Course Number: 55.1250.0*
*Prerequisite: None*
*Credit: 1 (T)*

This grade 9-12 course is designed to complement and support the development of skills and knowledge in the areas of math, science, and English in order to aid students in mastering the skills and knowledge necessary to pass the required MSDE high school assessments (HSA) and course experiences in the areas of algebra, biology, and English. This course is intended to provide the basic technology education course credit experience required for Maryland high school graduation.

**Engineering Principles and Applications**
*Course Number: 55.3500.4 (H)*
*Prerequisites: Successful completion or concurrent enrollment in Chemistry and Geometry are recommended before enrollment in this course.*
*Credit: 1 (T) (H)*

This grade 10-12 course is designed to complement and support the development of skills and knowledge in the areas of science, technology, engineering, and math. Geometry and chemistry content are integrated into this course through the examination of molecular models, biotechnology, beam, bridge, and barge engineering design challenges.

**Engineering Technology**
*Course Number: 55.3500.5 (GT)*
*Prerequisites: Successful completion or concurrent enrollment in Physics and College Algebra or above are recommended before enrollment in this course.*
*Credit: 1 (T) (GT)*

This grade 11-12 course is intended to provide the basic technology education course credit experience required for graduation. It is designed to complement and support the development of skills and knowledge in the areas of science, technology, engineering, and math. This course covers topics in a variety of engineering disciplines and examines the methods and processes used in the civil, surveying, construction, biotechnical, electrical, and other engineering fields. Topics include soil mechanics, project management, technical organization, and measurement equipment.
**Advanced Design Applications**  
Course Number: 55.1600.0  
Prerequisites: Completion of Basic Technology Education credit courses are required.  
Credit: 1  
Note: Elective for grades 10-12.

This course is designed to develop technological literacy in the areas of manufacturing, construction, energy/power, and transportation. The use of “hands-on” activities provides students with opportunities to participate in a wide range of problem-solving and critical thinking activities.

**Advanced Technological Applications**  
Course Number: 55.1500.0  
Prerequisite: Completion of Basic Technology Education credit course is required.  
Credit: 1

This course is designed to develop technological literacy in the areas of information and communication, entertainment and recreation, medical and agricultural, and related biotechnologies. The use of “hands-on” activities provides students with opportunities to participate in a wide range of problem-solving and critical thinking activities.

**Engineering Design and Research**  
Course Number: 55.8500.4 (H) 5.8500.5 (GT)  
Prerequisite: Completion of Engineering Principles and Applications or Engineering Technology is required.  
Credit: 1  
Note: Capstone course for grade 12.

This course prepares students to understand and apply engineering concepts and processes. Group and individual activities engage students in creating ideas, developing innovations, and engineering practical solutions. Engineering and design content, resources, and laboratory/classroom activities encourage student applications of science, mathematics, and other school subjects in authentic situations.

**Impacts and Issues of Technology**  
Course Number: 56.0100.0  
Prerequisite: Completion of Basic Technology Education credit course is required.  
Credit: 1

This course prepares students to investigate the critical, historical, and emerging issues affecting the creation, development, use, and control of technology. Students also evaluate the appropriateness and effectiveness of various technologies. Case studies, simulations, portfolio developments, and group seminars are ways that students address complex issues and propose alternative solutions to technological developments. Global governmental, social, and economic policies concerning technology are studied.

**Project Lead the Way (PLTW) Pre-Engineering Program**  
Project Lead The Way (PLTW) is a CTE instructional program that incorporates the national standards of The National Council of Teachers of Mathematics, the National Science Standards, and the International Technology Education Association. The program prepares students for further education and careers in engineering and engineering technology. Students are expected to:

1. Develop thinking skills by solving real-world engineering problems.  
2. Produce, analyze, and evaluate models of project solutions using computer software.  
3. Test and analyze digital circuitry using industry-standard computer software.  
4. Work in teams to complete challenging, self-directed projects. Mentored by engineers, students design and build solutions to authentic engineering problems.  
5. Produce architectural designs using computer software and work in teams to develop project planning skills.  
6. Apply scientific and engineering concepts to design materials and processes that directly measure, repair, improve, and extend systems in different environments.

**Introduction to Engineering Design – PLTW** (CH, WD)  
Course Number: 56.0200.4 (H)  
Prerequisite: Completion of Algebra 1  
Credit: 1 (T) (H)

This Project Lead the Way (PLTW) pre-engineering foundation course emphasizes the development of a design. Students use computer software to produce, analyze and evaluate models of project solutions. They study the design concepts of form and function, then use state-of-the-art technology to translate conceptual design into reproducible products.

**Principles of Engineering – PLTW** (CH, WD)  
Course Number: 56.0210.4 (H)  
Prerequisite: Completion of Algebra I  
Credit: 1 (T) (H)

This Project Lead the Way (PLTW) pre-engineering foundation course provides an overview of engineering and engineering technology. Students develop problem-solving skills by tackling real-world engineering problems. Through theory and practical hands-on experiences, students address the social and political consequences of technological change.

**Digital Electronics – PLTW** (CH, WD)  
Course Number: 56.0220.4 (H)  
Prerequisite: Completion of Introduction to Engineering Design-PLTW and Principles of Engineering-PLTW  
Credit: 1 (H)

This Project Lead the Way (PLTW) pre-engineering foundation 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 watches, calculators, video games, and computers. Students use industry-standard computer software in testing and analyzing digital circuitry.
Civil Engineering and Architecture – PLTW (WD)
Course Number: 56.0230.4 (H)
Prerequisites: Completion of Introduction to Engineering Design-PLTW and Principles of Engineering-PLTW
Credit: 1 (H)

This Project Lead the Way (PLTW) pre-engineering pathway course provides an overview of the fields of civil engineering and architecture, while emphasizing the interrelationship and dependence of both fields on each other. Students use state of the art software to solve real world problems and communicate solutions to hands-on projects and activities.

Aerospace Engineering - PLTW (CH)
Course Number: 56.0240.4 (H)
Prerequisites: Completion of Introduction to Engineering Design-PLTW and Principles of Engineering-PLTW
Credit: 1 (H)

This Project Lead the Way (PLTW) pre-engineering pathway course introduces students to the world of aeronautics, flight, and engineering. Students in this course will apply scientific and engineering concepts to design materials and processes that directly measure, repair, improve, and extend systems in different environments.

Engineering Design and Development – PLTW (CH, WD)
Course Number: 56.0250.4 (H)
Prerequisites: Completion of Introduction to Engineering Design-PLTW, Principles of Engineering-PLTW, Digital Electronics-PLTW, and Aerospace Engineering or Civil Engineering and Architecture-PLTW
Credit: 1 (H)
Note: Capstone course for grade 12.

This Project Lead the Way (PLTW) pre-engineering capstone course enables students to apply what they have learned in academic and pre-engineering courses as they complete challenging, self-directed projects. Students work in teams to design and build solutions to authentic engineering problems. This course equips students with the independent study skills that they will need in postsecondary education and careers in engineering and engineering technology.
WHAT ARE ADVANCED TECHNOLOGY EDUCATION COURSES?

Advanced technology education is an instructional program in which students develop advanced skills and understandings related to the use, assessment, design, and production of technological systems. It is a series of course offerings that meet Maryland’s high school graduation requirement for advanced technology education. Advanced technology education courses provide expectations and opportunities for students to:

- Work independently at an accelerated pace,
- Engage in more rigorous and complex content and processes, and
- Develop authentic products that reflect students’ understanding of key concepts.

Courses involve accelerated and enriched learning experiences that require abstract and higher-order thinking skills. Completion of two or more advanced technology education courses enables students to achieve an enhanced level of technological literacy where students are intrinsically engaged with the community and advocate for technology at defined levels of society. Advanced technology education courses prepare students for further education in the areas of science, technology, engineering, or mathematics (STEM).

Approved Courses & Credit

Courses Meeting the Advanced Technology Education Pathway

The following is a listing of Baltimore County Public Schools’ courses approved to meet the Maryland Advanced Technology Education Graduation credit requirement. These courses have been reviewed and approved by the Technology Education Graduation Credit Committee, Division of Curriculum and Instruction.

Note: (H) denotes Honors Level - (GT) denotes Gifted & Talented Level

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<td>Advanced Design Applications</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>56.0110.0</td>
<td>Advanced Design Applications - PET</td>
<td>½</td>
<td></td>
</tr>
<tr>
<td>56.0120.0</td>
<td>Advanced Design Applications - MAN/CON</td>
<td>½</td>
<td></td>
</tr>
<tr>
<td>55.1500.0</td>
<td>Advanced Technological Applications</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>56.0130.0</td>
<td>Advanced Technological Applications - INFO/REC</td>
<td>½</td>
<td></td>
</tr>
<tr>
<td>56.0140.0</td>
<td>Advanced Technological Applications - BIO/MED</td>
<td>½</td>
<td></td>
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<tr>
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<td>Engineering Design and Research (Honors)</td>
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<tr>
<td>56.0160.0</td>
<td>Impacts of Technology</td>
<td>½</td>
<td></td>
</tr>
<tr>
<td>56.0150.0</td>
<td>Technological Issues</td>
<td>½</td>
<td></td>
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Office of Technology Education – Maryland Technology Education VSC Implementation Plan

High School Technology Education Program of Courses

In order to comply fully with the October, 2005 MSDE, COMAR and VSC requirements for Technology Education, Baltimore County Public Schools will implement a program of course work as identified in this graphic presentation. The goal of this program of courses is to develop students who are technologically literate. The International Technology Education Association defines technological literacy as “the ability to use, manage, understand, and assess technology.”