



Advanced Technological Applications At-A-Glance

Intended Audience: Grades 10-12

Course Length: 36 weeks

In the *Advanced Technological Applications* course, students study five components of the Designed World.

- **Engineering Design Graphics and Spatial Skills:** The purpose of this unit is to assist students in understanding the concepts and principles underlying orthographic projections; how to create 2D drawings and 3D solid models using CAD software and apply these techniques to solve real-world problems.
 - Primary Challenge: Designing for Assisted Living. Students create an accurate description of a moderately complex design and will modify an existing design using an ADA design brief.
- **Cybersecurity:** Today, there are approximately 3.2 billion internet users worldwide. With that many users, connecting to the internet leaves computers and users vulnerable. This unit is intended to help students become well informed about protecting their personal information online and maintaining a safe internet presence.
 - Primary Challenge: Public Service Announcement. Students will create a Public Service Announcement campaign to target specific age groups with age-appropriate cybersecurity tips. They will design and create computer-generated posters to distribute to three targeted groups: elementary ages, middle school ages, and high school ages through age 70.
- **Biotechnology:** Students will learn about current technological systems that employ organisms as tools as well as develop their own ideas as to how technological systems can be further improved with creativity.
 - Primary Challenge: Johanna's Market Stand. Students will solve a real-world problem for the end user, Johanna. The end user is interested in increasing her profits at her local farmer's market stand. The solution must incorporate the use of animals, plants, or microorganisms (or parts of these organisms) as tools.
- **Information Technology:** This unit is intended to help students gather, select, evaluate, and utilize diverse data to communicate the model to help make decisions about their design or solution and communicate their analysis and solution to diverse audiences. Students will learn to use Excel™ as a data analysis tool and Alice™ as a visualization/3D modeling tool for communication purposes.
 - Primary Challenge: Unjamming Traffic: Visualize to Communicate. Students (teams) will be responsible for designing and implement their traffic "un"-jamming model from the preliminary challenge through an animation in Alice.
- **Robotics:** The purpose of this unit is to expose students to principles of automation and enable them to understand automated technologies around them so they can make educated decisions about them and so they can create new ones. This unit culminates the *Advanced Technological Application* course by synthesizing concepts students learned through the course and providing students an opportunity to demonstrate their learning through hands-on and minds-on learning experiences.
 - Primary Challenge: Electromechanical Robotics. Students will be able to design a self-driving car program to navigate a course with obstacles.



For More Information

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