Foundations of Technology and Engineering At-A-Glance

Intended Audience: Grades 9-10   **Course Length: 36 weeks**

Foundations of Technology and Engineering prepares students to understand and apply technological concepts and processes that are the cornerstone for the high school technology and engineering program. Group and individual activities engage students in creating ideas, developing innovations, and engineering practical solutions. Technology and Engineering content, resources, and laboratory/classroom activities apply student applications of science, mathematics, and other school subjects in authentic situations. The educator is offered the choice to use Onshape, or CAD for Unit 5/5a when teaching the courseware.

- **Computer Science Principles byDesign**: develop technological skills in solving problems, documenting the engineering design process, and computer coding.
    - o   Block Coding Principles
    - o   Variables and Functions
    - o   Computer Programming Logic
    - o   Sensors and Mathematics
    - o   3D Modeling with Onshape

- **The Engineering Design Process**: a systematic iterative problem solving method that produces solutions to meet human wants and desires.
    - o   Engineering Design Process
    - o   Criteria and Constraints
    - o   Design Principles
    - o   Prototypes and Modeling
    - o   Collecting and Processing
    - o   Applying the Design

- **The Designed World**: A byproduct of the engineering design process, which transforms resources (tools/machines, people, information, energy, capital, and time) into usable products and services.
    - o   Energy and Power
    - o   Manufacturing
    - o   Construction
    - o   Information and Communication
    - o   Agriculture and Transportation
    - o   Telemedicine

- **Systems:** The building blocks of technology and users must properly maintain, troubleshoot, and analyze systems to ensure safe and proper function.
    - o   Core Technologies: Every system and product is made up of one or more of the nine core technologies: bio-, electrical, electronic, fluid, material, mechanical, optical, structural, and thermal technology.
    - o   Systems Model: The Universal Systems Model
    - o   Reverse Engineering
    - o   Troubleshooting

- **Design with CAD Systems**: CAD systems (Unit 5) allow for engineers, technicians, and designers to communicate ideas effectively and efficiently while transcending barriers of location, time, and language.
    - o   AutoCAD command introduction and skill development, Community Design Project, Global Design Project, and Industry Certification Preparation
- **Onshape Certification by Design:** Sketching and Features (Unit 5a) enables students to complete modeling, assembling, and engineering drawing challenges while designing parts/assemblies.
    - o   Industry Certification Preparation, Sketching, Extrusions, Constraining, Variables, and Measurements.

For More Information

Contact Us At

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