Foundations of Technology and Engineering- ONLINE At-A-Glance

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

Foundations of Technology and Engineering Online prepares students to understand and apply technological concepts and processes that are the cornerstone for the high school technology program. Group and individual activities engage students in creating ideas, developing innovations, and engineering practical solutions. Technology content, resources, and laboratory/classroom activities apply student applications of science, mathematics, and other school subjects in authentic situations. Each unit is listed below along with the Learning Cycles for the unit. This course is student facing. Students may complete with minimal instructor input. The educator is offered the choice to use Onshape, or CAD for Unit 5/5a when teaching the courseware.

- **Technological Inventions and Innovations**: A result of evolutionary technological development and systematic research and development.
    - The History of Technology
    - Inventions and Innovations: An Evolutionary Process
    - The Role of Research and Development: A Problem-Solving Approach
    - Advertising and Marketing Effects on Technology

- **The Engineering Design Process**: A systematic iterative problem-solving method that produces solutions to meet human wants and desires.
    - Engineering Design Process
    - Criteria and Constraints
    - Design Principles
    - Prototypes and Modeling
    - Collecting and Processing
    - 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.
    - Energy and Power
    - Manufacturing
    - Construction
    - Information and Communication
    - Agriculture and Transportation
    - Telemedicine

- **Systems Engineering and Technology:** The building blocks of technology and users must understand, properly maintain, troubleshoot, and analyze systems to ensure their safe and proper function.
    - Systems Model: The Universal Systems Model
    - Core Technologies
    - Simple Machines
    - Electrical Fundamentals
    - Reverse Engineering
    - Engineering Systems

- **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.
    - 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.
    - Industry Certification Preparation, Sketching, Extrusions, Constraining, Variables, and Measurements.

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For More Information

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