



## Course Outcome Summary

### Course Information: **Introduction to Technology Education**

**Description:** This is an exploratory class in technology education for 9th grade students. Students will rotate through several instructors each exploring a specific field or industry. The major units covered within these fields will be: shop and power equipment safety; hand drafting and print reading; problem solving and the design process; manufacturing; technical career awareness. Throughout the semester students will be doing problem-solving projects relating to different technical fields. (Safety Glasses Required)

**Instruction Level:** Grades 9- 12

**Total Credits:** 1

**Prerequisites:** NONE

**Textbooks:** NONE

### Course Standards:

#### Common Career and Technical Core:

- Communicate and collaborate with others to accomplish tasks and develop solutions to problems and opportunities.
- Identify and apply employability skills.
- Assess benefits and challenges of working in diverse settings and on diverse teams.
- Apply leadership skills in real-world, family, community and business and industry applications.

#### Wisconsin Career and Technical Standards:

- Analyze the attributes of engineering design.
- Describe and apply engineering design.
- Evaluate completed solutions and provide feedback.
- Analyze and use tools and materials.
- Describe how systems can fail because of design flaws, defect parts, poorly matched parts or they were used beyond their design capabilities.
- Choose and perform the material processing operations of forming {e.g., bending, pressing, drawing, rolling}, bonding {e.g., gluing, soldering, brazing, spot welding, gas welding, arc welding}, fastening {e.g., screws, nuts & bolts, rivets, clips, pins, nails} and finishing {e.g., surface preparation, cleaning, treatment, coating}.
- Build, test and troubleshoot simple linear, rotary and compound mechanisms.

- Justify the application of structural materials and their trade-offs in the design of structures based on design requirements through optimization {i.e., engineering design process}.

### **ACT Standards**

- Use a word, phrase, or sentence to accomplish a straightforward purpose (e.g., conveying a feeling or attitude)
- Estimate the length of a line segment based on other lengths in a geometric figure.
- Find basic information in text that describes a simple experiment
- Understand the tools and functions of tools used in a simple experiment
- Understand a simple experimental design

## Unit

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- 1. Shop and power equipment safety**
- 2. Hand drafting and print reading**
- 3. The Design Process**
- 4. Manufacturing**
- 5. Technical career awareness**

## Unit Outlines

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### **1. Shop and power equipment safety**

#### **Standards:**

- Analyze and use tools and materials.
- Understand the tools and functions of tools used in a simple experiment

#### **Essential Questions:**

- What are the safety procedures I must follow when working within the different shop/lab areas of the Tech Ed department?

#### **Essential Knowledge:**

- Students will learn the importance and purpose of safety procedures/rules in shop areas, and procedures for safe operation of power equipment including the drill press, band saw, disk / belt sander, metal lathe, bench grinder, and various hand tools.

## 2. Hand drafting and print reading

### Standards:

- Communicate and collaborate with others to accomplish tasks and develop solutions to problems and opportunities.
- Analyze the attributes of engineering design.
- Estimate the length of a line segment based on other lengths in a geometric figure.

### Essential Questions:

- What are the different line types used when drafting? How do you create an orthographic draft of an object?

### Essential Knowledge:

- Students will learn the basics in hand sketching and then focus on 2D hand-drafting.
- Students will learn the alphabet of lines as well as what orthographic (3-view) and isometric (3D) drawings are and how to create them.
- Students will use these skills throughout the semester as they complete their projects in various technical fields.

## 3. The Design Process

### Standards:

- Communicate and collaborate with others to accomplish tasks and develop solutions to problems and opportunities.
- Analyze the attributes of engineering design.
- Describe and apply engineering design.
- Evaluate completed solutions and provide feedback.
- Understand a simple experimental design

### Essential Questions:

- How do I create and test a solution for a real world technical scenario?

### Essential Knowledge:

- Students will be able to define a problem, brain storm solutions, research and generate ideas, identify criteria and specific constraints, explore possible solutions, select an approach, develop design proposal, make a model or prototype, test and evaluate the design and redesign, create or make it, communicate processes or results

## 4. Manufacturing

### Standards:

- Communicate and collaborate with others to accomplish tasks and develop solutions to problems and opportunities.
- Assess benefits and challenges of working in diverse settings and on diverse teams.
- Analyze and use tools and materials.
- Describe how systems can fail because of design flaws, defective parts, poorly matched parts or parts that were used beyond their design capabilities.
- Choose and perform the material processing operations of forming {e.g., bending, pressing, drawing, rolling}, bonding {e.g., gluing, soldering, brazing, spot welding, gas welding, arc welding}, fastening {e.g., screws, nuts & bolts, rivets, clips, pins, nails} and finishing {e.g., surface preparation, cleaning, treatment, coating}.
- Build, test and troubleshoot simple linear, rotary and compound mechanisms.

### Essential Questions:

How do I safely use equipment and materials to create a tangible object that performs a specific function or task ?

### Essential Knowledge:

- Students will utilize power equipment and hand tools to make products and solve design problems.
- Students will create products such as a mouse trap car, screwdriver, hydraulic arm, and bridge structure

## 5. Technical career awareness

### Standards:

- Identify and apply employability skills.
- Apply leadership skills in real-world, family, community and business and industry applications.

### Essential Questions:

- Am I aware of the career opportunities available and the programs of study that align with my potential interests?

### Essential Knowledge:

- Students will explore different career opportunities in the CTE fields based on their skills and interests.
- Students will investigate pathways to careers starting with education and training, placement and employability as well as future outlooks for a particular career.