

# STRANDS AND STANDARDS

## MANUFACTURING TECHNOLOGY



### Course Description

An introductory course focused on the world of manufacturing technology. Students will gain an understanding of how manufacturing technologies impact politics, the environment, society, and the economy. Students will develop a foundation in essential abilities and attitudes that will in turn expand their occupational opportunities in the manufacturing world.

Core Code	38.03.00.00.060
Concurrent Enrollment Core Code	None
Units of Credit	0.5
Intended Grade Level	8-9
Prerequisite	None
Skill Certification Test Number	620
Test Weight	0.5
License Area of Concentration	Secondary
Required Endorsement(s)	Technology & Engineering, or
	Technology

## STRAND 1

**Students will follow safety practices.**

### Standard 1

Identify potential safety hazards and follow general laboratory safety practices.

- Assess workplace conditions regarding safety and health.
- Identify potential safety issues and align with relevant safety standards to ensure a safe workplace/jobsite.
- Locate and understand the use of shop safety equipment.
- Select appropriate personal protective equipment.

### Standard 2

Use safe work practices.

- Use personal protective equipment according to manufacturer rules and regulations.
- Follow correct procedures when using any hand or power tools.
- Ref: <https://schools.utah.gov/cte/engineering/resources> under the Safety Program and Management tab.

### Standard 3

Complete a basic safety test without errors (100%) before using any tools or shop equipment.

## STRAND 2

**Students will develop an understanding of the cultural, social, economic, and political effects of technology, the effects of technology on the environment, the role of society in the development and use of technology, and the influence of technology on history.**

### Standard 1

In order to be aware of the history of technology, students should learn that:

- Many inventions and innovations have evolved by using slow and methodical processes of tests and refinements.
- The specialization of function has been at the heart of many technological improvements.
- The design and construction of structures for service or convenience have evolved from the development of techniques for measurement, controlling systems, and the understanding of spatial relationships.
- In the past, an invention or innovation was not usually developed with the knowledge of science.

### Standard 2

In order to realize the impact of society on technology, students should learn that:

- Throughout history, new technologies have resulted from the demands, values, and interests of individuals, businesses, industries, and societies.
- The use of inventions and innovations has led to changes in society and the creation of new needs and wants.

- Social and cultural priorities and values are reflected in technological devices.
- Meeting societal expectations is the driving force behind the acceptance and use of products and systems.

### Standard 3

In order to understand the effects of technology on the environment, students should learn that:

- The management of waste produced by technological systems is an important societal issue.
- Technologies can be used to repair damage caused by natural disasters and to break down waste from the use of various products and systems.
- Decisions to develop and use technologies often put environmental and economic interests in direct competition with one another.

## STRAND 3

**Students will develop an understanding of and be able to select and use appropriate manufacturing technologies.**

### Standard 1

In order to better understand manufacturing technologies, students should learn that:

- Materials must first be located before they can be extracted from the earth through such processes as harvesting, drilling, and mining.
- Materials have different qualities and may be classified as natural, synthetic, or mixed.
- Manufacturing systems are mechanical processes that change the form of materials through the process of separating, forming, combining, and conditioning.
- Chemical technologies are used to modify or alter chemical substances and provide a means for humans to alter or modify materials and produce chemical products.

### Standard 2

In order to select and use manufacturing technologies, students should learn that:

- The manufacturing process includes the designing, development, making, and servicing of products and systems.
- Manufacturing systems may be classified into types, such as customized production, batch production, and continuous production.
- Manufactured goods may be classified as durable and non-durable. Durable goods are designed to operate for a long period of time, while non-durable goods are designed to operate for a short period of time.
- The interchangeability of parts is an inherent requirement of an effective manufacturing processes.
- Servicing keeps products in good condition.

### Standard 3

Demonstrate basic technical drawing and reading skills.

## Standard 4

Take measurements using basic equipment used in manufacturing.

- Steel rule
- Digital or analog caliper
- Micrometer

## STRAND 4

**Students will define free enterprise and marketing as it relates to manufacturing.**

### Standard 1

In order to define free enterprise and marketing, student should learn that:

- The basic concepts of entrepreneurship.
- The process of obtaining capital and managing finances.
- Marketing a product involves conducting research on its potential, establishing a product's identity, advertising it, selling it, and distributing it.

## STRAND 5

**Students will design and operate to a mass production system that creates a product of value.**

### Standard 1

In order to better understand a production system, students will:

- Assume an individual production role within a continuous system.
- Understand the importance of labor efficiency and be able to identify ways to improve a mass production system.
- Include evidence of planning that ensures the product, system, or service meets established criteria.

## STRAND 6

**Students will investigate the educational pathways and career opportunities in the manufacturing industry.**

### Standard 1

Identify occupations related to the manufacturing industry.

### Standard 2

Identify different types of occupational training.

## Skill Certificate Test Points by Strand

Example table below. Refer to instructions for specifics.

Test Name	Test #	Number of Test Points by Strand						Total Points	Total Questions
		1	2	3	4	5	6		
Manufacturing Technology	620	13	7	25	5	10	3	63	52

### Performance Skills

1. Create and utilize an engineering notebook per established conventions.  
<https://schools.utah.gov/cte/engineering/resources>
2. Demonstrate practice of the *Technology & Engineering Professional Workplace Skills*.  
<https://schools.utah.gov/cte/engineering/resources>
3. Participate in a significant activity that provides each student with an opportunity to render service to others, employ leadership skills, or demonstrate skills they have learned through this course, preferably through participation in a Career & Technical Student Organization (CTSO) such as the Technology Student Association (TSA).