

Course Title: Fundamentals of Manufacturing
Course Number: 9260400
Course Length: One Year

Course Description:

This course provides students with opportunities to become familiar with related careers and develop fundamental technological literacy as they learn about the history, systems, and processes of manufacturing. In addition, the course will provide an overview of the safe use of tools and equipment used in the industry.

CTE Standards and Benchmarks	
01.0	Demonstrate an understanding of the societal impact of manufacturing--The student will be able to:
01.01	Track the evolution of manufacturing and its impact on society.
01.02	Explain the educational requirements and professional expectations associated with a career in manufacturing.
01.03	Describe the impact of governmental and political systems on manufacturing.
01.04	Explain the interaction between manufacturing industries and social change
01.05	Explain how manufacturing made the United States a world leader.
01.06	Describe the relationship between manufacturing and the environment
01.07	Explain the importance of a technologically literate workforce to the manufacturing industry.
02.0	Demonstrate an understanding of the history of manufacturing--The student will be able to:
02.01	Identify key historical events and their impact on manufacturing.
02.02	List key persons who have contributed to change in manufacturing.
02.03	Describe the Industrial Revolution and its impact on manufacturing.
02.04	Identify pioneers of the manufacturing industry.
02.05	Describe/debate the affect that automation has had on manufacturing.
03.0	Demonstrate an understanding of the universal systems model as it relates to manufacturing--The student will be able to:
03.01	Describe the processes of input, processing, output, and feedback that comprise the universal systems model.
03.02	Demonstrate applications of the universal systems model in manufacturing.
03.03	Describe the role of time, capital, people, tools and machines, energy, materials, and information within the universal systems model as it applies to manufacturing industries.

CTE Standards and Benchmarks

04.0 Demonstrate an understanding of safe work practices while performing tasks--The student will be able to:

- 04.01 Identify safety equipment.
- 04.02 Recognize immediate, potential, and hidden hazards.
- 04.03 Perform housekeeping tasks related to maintaining a safe work environment.
- 04.04 Pass a safety test with a perfect score prior to operating equipment.
- 04.05 Demonstrate the proper safe use of tools and equipment
- 04.06 Identify safety color codes

05.0 Identify materials and resources used in manufacturing--The student will be able to:

- 05.01 Describe the seven basic technological resources.
- 05.02 Describe the properties of manufacturing materials.
- 05.03 Explain how materials are classified.
- 05.04 List, measure, and compare common mechanical properties of select materials.
- 05.05 List sources and costs where materials may be obtained
- 05.06 Create a bill of materials
- 05.07 Calculate production cost analysis

06.0 Describe the essential systems and processes involved in manufacturing--The student will be able to:

- 06.01 Compare and contrast custom, intermittent, and continuous manufacturing systems.
- 06.02 Demonstrate fundamentals of producing technical sketches.
- 06.03 Create simple two and three dimensional drawings using CAD software.
- 06.04 List common hand tools used in the maintenance, installation, and repair of equipment.
- 06.05 Identify commonly used power tools.
- 06.06 Describe primary manufacturing processes.
- 06.07 List secondary manufacturing processes.

CTE Standards and Benchmarks

06.08	Define the terms separating and forming as it relates to manufacturing.
06.09	Identify separating processes – traditional and non-traditional.
06.10	Identify forming processes including casting, molding, compression, stretching, and conditioning.
06.11	Differentiate between combining processes such as mixing, bonding, coating, and mechanical filtering.
06.12	Produce a simple part applying computer assisted production equipment.
06.13	Program a robot to perform a repetitive task.
06.14	Create a device that will perform a task using a computer controlled program.
06.15	Describe the advantages/disadvantages of the separation processing of materials using manual versus computer controlled machinery.
06.16	Describe assembling processes.
06.17	Explain the importance of finishing processes.
06.18	Describe the role of quality control in the manufacturing process.
06.19	Explain the importance of quality control within a manufacturing system.
07.0	Perform a pre-planned introductory manufacturing activity applying correct safety procedures, appropriate use of materials, and processing operations--The student will be able to:
07.01	Use hand and power tools safely.
07.02	Demonstrate fundamentals of reading technical sketches.
07.03	Use English and/or metric measurement effectively in order to properly lay out a part for manufacturing.
07.04	Follow a production flow chart to produce a teacher-selected product.
07.05	Apply appropriate problem solving to improve an existing manufacturing system.
08.0	Use visual and verbal communication to present employment and career opportunities in manufacturing--The student will be able to:
08.01	Present a technical report to an audience regarding a researched manufacturing related career using multimedia.
08.02	Prepare and produce a portfolio representing experiences throughout the course of study.
09.0	Students will select and demonstrate techniques, skills, tools, and understanding related to manufacturing--The student will be able to:
09.01	Use common tools correctly and safely.

CTE Standards and Benchmarks

09.02	Describe strategies for selecting materials and processes necessary for developing a technological system or artifact.
09.03	Demonstrate fundamental materials processing and assembly techniques.
09.04	Evaluate the interdependence of components in a technological system and identify those elements that are critical to correct functioning.
09.05	Apply analytical tools to the development of optimal solutions for technological problems.
10.0	Students will develop leadership and interpersonal problem-solving skills through participation in co-curricular activities associated with FL-TSA--The student will be able to:
10.01	Demonstrate effective communication skills.
10.02	Participate in teamwork to accomplish specified organizational goals.
10.03	Demonstrate cooperation and understanding with persons who are ethnically and culturally diverse.