STRANDS AND STANDARDS

MANUFACTURING PRINCIPLES 2

Course Description

The second in a sequence of courses addressing the history & operational structure of industry, lean manufacturing principles, product development, precision measurement, and quality management. Emphasis is placed on the interaction of process selection, strength optimization, cost, and overall quality.

Core Code	38.01.00.00.012
Concurrent Enrollment Core Code	None
Units of Credit	0.5
Intended Grade Level	10-12
Prerequisite	Manufacturing Principles 1
Skill Certification Test Number	Industry Certification
Test Weight	0.5
License Area of Concentration	Secondary Education
Required Endorsement(s)	Technology & Engineering, or
	Engineering

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 gain an understanding of how a typical corporation is structured and how the responsibilities for various aspects of production are often organized.

Standard 1

Understand the company vision and how the employee fits into that vision and mission.

Standard 2

Understand how a typical corporation is organized and what each department contributes.

- Production
- Engineering
- Accounting
- Shipping & Receiving
- Quality Control
- Human Resources

Standard 3

Understand how Production Systems are organized.

- Forecasting
- Production Planning
- Plant Layout
- Inventory Control
- Work Measurement

- Job Sequencing
- Operation Scheduling

Standard 4

Understand the value of the end product and how each employee's actions positively or negatively affect that value.

STRAND 3

Students will correctly interpret advanced tolerancing, including Geometric Dimensioning and Tolerancing (GD&T).

Standard 1

Calculate the potential result of a "tolerance stack".

Standard 2

Determine whether or not a selection of parts are "within spec".

Standard 3

Understand the use of and responsibilities associated with the use of a quality stamp.

STRAND 4

Students will increase their ability to both comprehend and create technical documents.

Standard 1

Communicate professionally using email.

Standard 2

Use software applications commonly found in the workplace.

- MS Excel
- MS Word

STRAND 5

Students will be introduced to the basic elements of Statistical Process Control.

Standard 1

Understand essential concepts and terminology used in statistics.

- Scatter plot
- Bell curve
- Average
- Mean
- Median
- Mode
- Variation
- Standard deviation

Standard 2

Create and correctly interpret an X-Y work chart to bring a process in control and make it more capable.

STRAND 6

Students will complete the requirements to earn certification from an industry recognized institution in Six Sigma and/or Lean Manufacturing.

Standard 1

Industry recognized Lean Bronze certifications include:

- ASQ
- AME
- Shingo Institute
- SME

Standard 2

Industry recognized Lean Six Sigma Yellow Belt certifications include:

- ASQ
- IASSC
- MSI
- SixSigma

Skill Certificate Test Points by Strand

Complete Lean Manufacturing Bronze or Six Sigma Yellow Belt Certification.

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).