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.

<table>
<thead>
<tr>
<th>Core Code</th>
<th>38.01.00.00.012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concurrent Enrollment Core Code</td>
<td>None</td>
</tr>
<tr>
<td>Units of Credit</td>
<td>0.5</td>
</tr>
<tr>
<td>Intended Grade Level</td>
<td>10-12</td>
</tr>
<tr>
<td>Prerequisite</td>
<td>Manufacturing Principles 1</td>
</tr>
<tr>
<td>Skill Certification Test Number</td>
<td>Industry Certification</td>
</tr>
<tr>
<td>Test Weight</td>
<td>0.5</td>
</tr>
<tr>
<td>License Area of Concentration</td>
<td>Secondary Education</td>
</tr>
<tr>
<td>Required Endorsement(s)</td>
<td>Technology &amp; Engineering, or Engineering</td>
</tr>
</tbody>
</table>
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.

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
MANUFACTURING PRINCIPLES 2

- 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/tech/publicationsresources](https://schools.utah.gov/cte/tech/publicationsresources)


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).