

**Course Title:** Manufacturing IV

**Board Approval Date:**

**Credit / Hours:** .5 credit

**Course Description:**

Manufacturing IV is the most advanced manufacturing course in the sequence offered in Engineering, Manufacturing and Industrial Technology (EMIT) Pathway. This course allows students to design and create a culminating project of their choosing involving the use of various materials. Students will be required to keep a journal/portfolio of their project.

**Learning Activities / Modes of Assessment:**

Large group / Individual instruction  
Participation & Clean Up  
Individual / Group Work  
Computer Aided Design  
Computer Numeric Controlled Equipment  
Desktop Publishing

Tests and Quizzes  
Checklists/Teacher Observations  
Projects with Rubrics

**Instructional Resources:**

[www.pacareerzone.com](http://www.pacareerzone.com)  
[www.discoveryeducation.com](http://www.discoveryeducation.com)  
Technology and Engineering Education Association of Pennsylvania  
Online Tutorials  
Technology Student Association  
Project Plans

## Course Pacing Guide

Course: **Manufacturing IV**

<b>Course Unit (Topic)</b>	<b>Length of Instruction (Days/Periods)</b>
1. Documentation of Student Product	7 days
2. Production	83 days

Topic: 1 Documentation of Student Product

Days: 7

Subject(s): Technology, Vocations

Grade(s): 10th, 11th, 12th

Know:	Understand:	Do:
<p><b>3.4.12.A2. – Essential</b> CORE CONCEPTS OF TECHNOLOGY - Describe how management is the process of planning, organizing, and controlling work.</p> <p><b>3.4.12.A3. – Essential</b> TECHNOLOGY CONNECTIONS - Demonstrate how technological progress promotes the advancement of science, technology, engineering and mathematics (STEM).</p> <p><b>3.4.12.C2. – Essential</b> ENGINEERING DESIGN - Apply the concept that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.</p> <p><b>3.4.12.C3. – Essential</b> RESEARCH &amp; DEVELOPMENT, INVENTION &amp; INNOVATION, EXPERIMENTATION/ PROBLEM SOLVING AND TROUBLESHOOTING - Apply the concept that many technological problems require a multi-disciplinary approach.</p>	<p>Magazine articles are written to instruct the reader on how to create the project.</p>	<p><b>3.4.12.A2. – Essential</b> CORE CONCEPTS OF TECHNOLOGY - Describe how management is the process of planning, organizing, and controlling work.</p> <p><b>3.4.12.A3. – Essential</b> TECHNOLOGY CONNECTIONS - Demonstrate how technological progress promotes the advancement of science, technology, engineering and mathematics (STEM).</p> <p><b>3.4.12.B1. – Essential</b> EFFECTS OF TECHNOLOGY - Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.</p> <p><b>3.4.12.C2. – Essential</b> ENGINEERING DESIGN - Apply the concept that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.</p> <p><b>3.4.12.C3. – Essential</b> RESEARCH &amp; DEVELOPMENT, INVENTION &amp; INNOVATION, EXPERIMENTATION/PROBLEM SOLVING AND TROUBLESHOOTING - Apply the concept that many technological problems require a multi-disciplinary approach.</p> <p><b>3.4.12.D2. – Important</b> USING AND MAINTAINING TECHNOLOGICAL SYSTEMS - Verify that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.</p> <p><b>3.4.12.E6. – Essential</b> MANUFACTURING TECHNOLOGIES - Compare and contrast the importance of science, technology, engineering and math (STEM) as it pertains to the manufactured world.</p> <p><b>3.4.12.E7. – Important</b> CONSTRUCTION TECHNOLOGIES - Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.</p>

Topic: 1 Documentation of Student Product

Days: 7

Subject(s): Technology, Vocations

Grade(s): 10th, 11th, 12th

Know:

Understand:

Do:

**3.4.12.D2. – Important USING AND MAINTAINING TECHNOLOGICAL SYSTEMS** - Verify that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.

**3.4.12.E6. – Essential MANUFACTURING TECHNOLOGIES** - Compare and contrast the importance of science, technology, engineering and math (STEM) as it pertains to the manufactured world.

**3.4.12.E7. – Important CONSTRUCTION TECHNOLOGIES** - Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Information needed to create a magazine article that could be used to reproduce their product.

Plans are necessary for the magazine article and production.

Pictures need to be included for clarification reader.

The article should include a description about the product as well

Develop the magazine article throughout the manufacturing process.

Topic: 1 Documentation of Student Product

Days: 7

Subject(s): Technology, Vocations

Grade(s): 10th, 11th, 12th

Know:	Understand:	Do:
<p>as the reasoning for choosing the specific style.</p> <p>A parts list as well as cost analysis should be included in the article.</p> <p>Their article should be written so that it could be used by the reader to recreate the product.</p> <p>3.4.12.A2. - CORE CONCEPTS OF TECHNOLOGY - Describe how management is the process of planning, organizing, and controlling work.</p> <p>3.4.12.B1. - EFFECTS OF TECHNOLOGY - Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.</p>		

Topic: 2 Production

Days: 83

Subject(s): Technology, Vocations

Grade(s): 10th, 11th, 12th

Know:

**3.4.12.A2. – Essential**  
CORE CONCEPTS OF TECHNOLOGY - Describe how management is the process of planning, organizing, and controlling work.

**3.4.12.C2. – Essential**  
ENGINEERING DESIGN - Apply the concept that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.

**3.4.12.C3. – Essential**  
RESEARCH & DEVELOPMENT, INVENTION & INNOVATION, EXPERIMENTATION/ PROBLEM SOLVING AND TROUBLESHOOTING - Apply the concept that many technological problems require a multi-disciplinary approach.

**3.4.12.D2. – Important**  
USING AND MAINTAINING TECHNOLOGICAL SYSTEMS - Verify that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.

Understand:

A person in the industrial technology field must be able to produce and assemble all parts for an advanced level project.

Do:

**3.4.12.A2. – Essential**  
CORE CONCEPTS OF TECHNOLOGY - Describe how management is the process of planning, organizing, and controlling work.

**3.4.12.C2. – Essential**  
ENGINEERING DESIGN - Apply the concept that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.

**3.4.12.C3. – Essential**  
RESEARCH & DEVELOPMENT, INVENTION & INNOVATION, EXPERIMENTATION/PROBLEM SOLVING AND TROUBLESHOOTING - Apply the concept that many technological problems require a multi-disciplinary approach.

**3.4.12.D2. – Important**  
USING AND MAINTAINING TECHNOLOGICAL SYSTEMS - Verify that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.

**3.4.12.E6. – Essential**  
MANUFACTURING TECHNOLOGIES - Compare and contrast the importance of science, technology, engineering and math (STEM) as it pertains to the manufactured world.

**3.4.12.E7. – Important**  
CONSTRUCTION TECHNOLOGIES - Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Safely use all necessary tools and machines to create and assemble the parts for the project.

Determine and apply the proper finish to the product.

Topic: 2 Production  
Subject(s): Technology, Vocations

Days: 83  
Grade(s): 10th, 11th, 12th

Know:	Understand:	Do:
<div>3.4.12.E6. – Essential MANUFACTURING TECHNOLOGIES - Compare and contrast the importance of science, technology, engineering and math (STEM) as it pertains to the manufactured world.</div> <div>3.4.12.E7. – Important CONSTRUCTION TECHNOLOGIES - Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.</div>		