Northern York County School District

Curriculum Overview

Course: Manufacturing & CNC	
Grade Level: 10-12	
Approval Date: March 2023	**Length of Time: 180 days / 1 credit**

Course Description:

Students must have completed Material Tech Woodworking to take this course. This course introduces students to the fundamentals of the manufacturing process. Areas of emphasis include shop safety, measuring techniques, use of woodworking tools and machines, use of a CNC machine/lathe and plasma cutter, budget projects and assembly line projects. Students will gain experience in technical processes associated with wood, metal and other composites. Students will be able to manufacture projects by themselves and with their classmates. Students will create files and be able to operate the CNC Machine/Lathe and Plasma Cutter.

Course Objectives:

- Students will understand the Manufacturing Process
- Students will understand and employ Shop and Machine Safety
- Students will individually and / or collaboratively design and manufacture projects
- Students will create files that apply to the CNC Machine/Late or Plasma Cutter
- Students will operate a CNC Machine/Late and Plasma Cutter

Related Standards:

Pennsylvania Academic Standards

- Analyze and use the technological design process to solve problems.
- Analyze physical technologies of structural design, analysis and engineering, personnel relations, financial affairs, structural production, marketing, research and design to real world problems.

Pennsylvania Technology and Engineering Standards

Design Thinking in Technology and Engineering Education

- Refine design solutions to address criteria and constraints.

Integration of Knowledge, Technologies, and Practices

- Evaluate how technology enhances opportunities for new products and services through globalization.

Design Thinking in Technology and Engineering Education

- Apply principles of human-centered design.

Units:

1. Measurement
2. Shop, Machine & Tool Safety
3. Technical drawings (Multiview & Isometric)
4. Introduction to the Manufacturing Process
5. Introduction to Fusion360
6. CNC Machine/Lathe & Plasma Cutter

Concepts:	**Competencies:**
• The manufacturing process.	• Students will be following safety procedures for the general shop and

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- Shop safety in the woodshop and metal shop
- Measurement.
- Machine operation in a wood shop and metal shop.
- CNC Machine/Lathe and Plasma Cutter operation.
- Apply real world manufacturing projects in a woodshop & metal shop setting.
- Career Retention and Advancement: cooperation & teamwork, group interaction, budgeting, and time management

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machines/tools daily mandated by the state of Pennsylvania.

- Students will be able to measure up to 1/16th of an inch.
- Students will be able to operate woodworking tools and machines such as the planer, jointer, table saw, drill-press, router machine, belt sanders, miter-saw, jigsaw, & bandsaw.
- Students will be able to operate CNC Machine/Lathe and Plasma Cutter. Students will create files that apply using the CNC and Plasma cutter specifications.

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Learning Activities:

- Teacher demonstration
- Peer teaching
- Group projects
- Individual projects
- Project videos
- Technical Drawings

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Performance Tasks:

- Quizzes
- Team design and production projects
- Budgeting projects
- Project Finishing

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Other Assessment Measures:
Self-reflection
Peer review
Project rubrics

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Textbook/Primary Resource:
Fusion 360

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Supplemental Resource Materials:
YouTube & Woodworking Texts & Instructional Material

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