

**Mission Statement:** It is the mission of the Elba Central School District to actualize the phrase “Elba Equals Educational Excellence for Everyone.” We are committed to providing both quality and equity. Every student will have the opportunity to develop to the best of his/her ability.

**Elba Standards:** In addition to the knowledge and basic skills they need in order to participate in society, graduates of Elba Central School will develop:

1. Empowering skills: decision making, goal setting, creative thinking and problem solving abilities;
2. Communication and social interaction skills;
3. Technological literacy;
4. Total wellness (social, physical, emotional health and self-esteem);
5. The values necessary to participate in society.

As a result of achieving these outcomes, our students will embrace lifelong learning.

**New York State Standards:**

From Learning Standards for Mathematics, Science and Technology

Standard 1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions.

Standard 2: Students will access, generate, process, and transfer information using appropriate technologies.

Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.

Standard 6: Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning.

Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.

**National Standards:**

Standard 1: Students will develop an understanding of the characteristics and scope of technology.

Standard 2: Students will develop an understanding of the core concepts of technology.

Standard 3: Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.

Standard 8: Students will develop an understanding of the attributes of design.

Standard 9: Students will develop an understanding of engineering design.

Standard 10: Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.

Standard 11: Students will develop abilities to apply the design process.

Standard 12: Students will develop abilities to use and maintain technological products and systems.

Standard 13: Students will develop abilities to assess the impact of products and systems.

**Performance Indicators:**

1. Demonstrate correct and safe method to using manufacturing equipment.
2. Design and construct the jigs and fixtures necessary for a manufacturing process.
3. Work as a part of a team in creating an assembly line.
4. Design a wood product capable of being manufactured.

<b>Assessment:</b>	<b>Acceptable Performance Level</b>
Local Exams	70% or higher
Participation in manufacturing process	90% of class time or more
Manufacturing Projects	70% or higher

**Scope:** Students will get an introduction to the manufacturing industry through class work and projects. All projects will be done as a class as it is the nature of manufacturing to use an assembly line process. The inputs, processes, and outputs of manufacturing will be discussed and demonstrated in class. Students will also take a look at current manufacturing industry standards and practices. Product design, assembly line design, and quality control are also practiced in class.

**Sequence:**

- I. System Command Input
  - A. Desired project
    1. Product selection
    2. Product specifications
    3. Pre-production planning
  - B. Expected impacts (environmental, economic, societal, personal)
- II. Resources for Manufacturing
  - A. People
    1. Job classification/career preparation
    2. Organizational structure
    3. Recruitment
  - B. Information
    1. History
      - a. Handcrafting
      - b. Mechanization/Automation
    2. Safety
    3. Technical knowledge
      - a. Research and development
      - b. Planning
      - c. Engineering
  - C. Materials
    1. Raw material sources
    2. Conversion from raw materials to industrial materials
    3. Procurement
    4. Comparative characteristics
  - D. Tools/machines
    1. Function/selection
    2. Operating techniques
    3. Maintenance
  - E. Capital

1. Sources
2. Disbursement
- F. Energy
  1. Types
  2. Applications
- G. Time
  1. Quantity
  2. Management
- III. Processes of Manufacturing
  - A. Forming
    1. Casting/molding
    2. Compressing/stretching
  - B. Separating
    1. Shearing
    2. Chip removal
    3. Non-traditional
  - C. Combining
    1. Mechanical fastening
    2. Adhesion/cohesion
    3. Mixing
    4. Coating
    5. Assembling
  - D. Conditioning
    1. Thermal, chemical, and mechanical
    2. Applications
- IV. Outputs of Manufacturing
  - A. Products
    1. Packaging
    2. Distribution
    3. Reclamation
    4. Servicing
  - B. Impacts
    1. Environmental
    2. Economic
    3. Societal
    4. Personal
- V. Control of Manufacturing
  - A. Reasons
    1. Quality assurance
    2. Profitability
  - B. Methods
    1. Monitor outputs
    2. Compare outputs with inputs
    3. Adjust processes

**Methodology:** 75-90% hands-on and visual learning. Remaining learning will take place through reading, lectures and discussions.