



FOREST LAKE AREA SCHOOLS

Inspire the Learner, Ignite the Potential

Course Title: Welding and Machine Tool Technology

Course Number: TBD

Grade Level: 10-12

Credit Hours: .5

Course Description:

Welding and Machine tool technology introduces students to more advanced Machine Tool, MIG, Arc and Oxy welding concepts. Students will build on the basic skills and knowledge of Introduction to Metals Technology. Major emphasis is placed on work holding devices, location principles, inspection, tooling and cutting tools. Students will use their skills to complete required and individual projects. Lab time will be utilized to develop the students' skill, while emphasizing safe work habits

Prerequisite:

Prerequisite: Successful completion of Introduction to Metals Technology with a final grade of "C" or instructor approval.

It is strongly recommended that students complete "Introduction to Drafting and Design" prior to taking this course.

Articulated Agreements / College Credit(if applicable):

Alignment with Minnesota Academic Standards or national/state contest standards:

Specific Course Learner Outcomes:

1. Students will develop a strong work ethic while applying a constant concern for safety while working in the metal shop.
2. Accurately cut, saw, mill, turn, grind and drill to specifications.
3. Calculate and apply proper speeds, feeds and setup on lab machinery.
4. Develop an ability to inspect, measure and record project measurements.

5. Develop an ability to cut threads on a lathe.
6. Produce a working drawing, develop a plan of procedure and a Bill of Material to complete a quality project
7. Cut shaped parts accurately using the plasma and oxy-fuel gas-cutting process.
8. Produce required quality welds in various positions.
9. Read a working drawing, follow a plan of procedure and calculate a Bill of Material to complete a quality project.

Course Outline with Pacing:

Course Content:

- I. Fasteners
 - A. Threaded Fasteners
 - B. Non-Threaded Fastening Devices

- II. Metal Lathe
 - A. Lathe Safety
 - B. Lathe Review
 - C. Lathe Tool Holders
 - D. Lathe Cutting Tools
 - E. Cutting Speeds and Feeds
 - F. Work-Holding Attachments
 - G. Turning Work Between Centers
 - H. Using Lathe Chucks and Chucking Operations
 - I. Cleaning the Lathe

- III. Cutting Screw Threads on a Lathe
 - A. Lathe Safety
 - B. Cutting Sharp V Threads (with a single point cutting tool)

- IV. Milling Machines
 - A. Milling Saety Practices
 - B. Milling Machines Axis
 - C. Milling Operations
 - D. Milling Methods
 - E. Milling Cutters
 - F. Milling Cutter Usage
 - G. Cutting Speeds and Feeds
 - H. Cutting Fluids
 - I. Work-Holding Attachments

- V. Complete a Project
 - A. Reading Orthographic Drawing
 - B. Reading Plan of Procedure
 - C. Calculate a Bill of Material

- VI. Introduce Weld Types
 - A. Sketch weld types

- VII. Safety
 - A. Review Safety Procedures in the Metals Shop
 - B. Safety Test

- VIII. Complete Welds in Various Positions
 - A. Tee
 - B. Butt
 - C. Lap
 - D. Corner

- IX. Advanced Gas Welding
 - A. Gas Welding Safety Precautions
 - B. Advanced Gas Welding Procedures
 - C. Brazing and Braze Welding

- X. Advanced Shielded Metal Arc Welding
 - A. Safety Precautions for Arc Welding
 - B. Advanced Gas Welding Techniques

- XI. Advanced Gas Metal Arc Welding
 - A. Safety Precautions for MIG Welding
 - B. Advanced MIG Welding Techniques

Additional Information: