

## **Machine Tool Technology**

1 Semester – ½ credit

Open to grade 9-12

Prerequisite Course: Machine Metalworking, grade C or better

Recommended Related Courses: Intro to CAD

Practical Welding, Metal Fabrication.

This course is intended to develop the fundamental skills for a career in the machining trade. Fundamental processes include; Manual lathe operation, layout, measurement, turning processes and tool geometry/sharpening. There is opportunity for CVTC enrollment that gives students advance standing and the possibility of dual credit that is free of charge to the student.

### **Major Course Objectives**

1. To build on the basic knowledge of the field of Machine Tool and Metal casting metalworking.
2. To give the students “hands-on” experiences in using metal working equipment.
3. To have the students develop safe work habits.
4. To stress to the student the desire to produce precise and high quality work.
5. To give the student insight to the rapidly changing and technical nature of the world of work.
6. To allow the students to explore the many career opportunities in the Machine Tool field.

### **Text**

“Machining Fundamentals” by John R. Walker

### All Units Covered Will Include:

1. Lecture / Discussion
2. Related Safety Information
3. Reading Assignments
4. Demonstrations
5. Related Videos
6. Lab Time for required projects

### Methods of Evaluation

1. Written Assignments
2. Written exams
3. Instructors Observations
4. Required Projects

### Machine Metalworking Outline

1. Introduction
  - a. Class
  - b. Instructor (s)
  - c. Course content / Projects
  - d. Administrative Procedures
2. Print Reading Review
  - a. Line Types
  - b. Abbreviations
  - c. Math review ( Fraction, Decimal, Metric)
  - d. Orthographic and isometric drawings
  - e. Surface Identification
  - f. Ruler Reading
  - g. Dimensions and Tolerances
3. Measuring Tools
  - a. Rulers (scales)
  - b. Micrometers
  - c. Calipers
  - d. Dial indicators
  - e. Gauge Blocks
  - f. Combination Squares
  - g. Verniers
4. Layout Tools and Procedures
  - a. Layout dyes
  - b. Scribes
  - c. Punches

- d. Compass / Dividers
- e. Surface Plate and Gauge
- f. Vee Blocks

5. Safety

- a. General / Common Sense
- b. Personal
- c. Tools and Machines (ongoing)
- d. First Aid

6. Engine Lathe

- a. Types
- b. Controls
- c. Safety
- d. Tooling
- e. Work Holding Devices
- f. Rpm Formulas
- g. Straight Turning
- h. Taper Turning
- i. Knurling
- j. Drilling and Reaming

7. CVTC Curriculum / Projects

- a. Tool Grinding
- b. Two – Step Turning
- c. Straight Center
- d. Hammer Head
- e. Hammer Handle Shank
- f. Hammer Handle
- g. Guide Bars
- h. Collar (Boring Exercise)