

**APP101 GENERAL MACHINIST** RELATED TECHNICAL INSTRUCTION (RTI) IS 570 HOURS AND RESULTS IN 3 TECHNICAL COLLEGE CREDITS (TCC) AND IS DONE IN CONJUNCTION WITH ON-THE-JOB TRAINING (OJT) THAT IS A TOTAL OF 4000 HOURS.

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## **RELATED TECHNICAL INSTRUCTION OUTLINE**

**(General Machinist)**

**O\*NET-SOC CODE: 51-4034.00 RAPIDS CODE: 1094CB**

**Program Description: Precision Machining and Manufacturing (MTT2):** The Machine Tool Technology Diploma program is a sequence of courses that prepares students for careers in the machine tool technology field. Learning opportunities develop academic, technical, and professional knowledge and skills required for job acquisition, retention, and advancement. The program emphasizes a combination of machine tool theory and practical application necessary for successful employment. Program graduates receive a Machine Tool Technology Degree/Diploma and have the qualification of a machine tool technician.

**Related instruction - This instruction shall include, but not be limited to the Technical Certificates of Credit listed.**

**BM31 – Basic Machinist** The Basic Machinist certificate program prepares students for a machine tool operator position with a machine shop or machine tool establishment. Topics include foundations of mathematics, an introduction to machine tool technology, and blueprint reading for machine tool applications.

**LP11 – Lathe Operator** The Lathe Operator technical certificate of credit prepares students in use and set up of lathes and about lathe tool grinding. Emphasis is placed on cutting threads, boring holes to precise measurements, and cutting tapers. Topics include an introduction to machine tool technology, blueprint reading for machine tool, and basic and advanced lathe operations.

**MP 11 – Mill Operator** The Mill Operator technical certificate of credit teaches students to effectively operate milling machinery. Students become proficient in blueprint reading, general mathematical operations, and are provided the necessary knowledge and skills to obtain employment as a milling machinist.

### **Course Descriptions:**

**MCHT 1011 - Introduction to Machine Tool** – 4 Credit Hours, 90 Contact Hours: Introduces the fundamental concepts and procedures necessary for the safe and efficient use of basic machine tools. Topics include: machine shop safety, terminology, use of hand and bench tools, analysis of measurements, part layout, horizontal and vertical band saw setup and operation, drill press setup and operation, and quality control.

**MCHT 1012 - Print Reading for Machine Tool** – 3 Credit Hours, 45 Contact Hours: Introduces the fundamental concepts necessary to develop blueprint reading competencies, interpret drawings, and produce sketches for machine tool applications. Topics include interpretation of blueprints, sketching, sectioning, geometric dimensioning and tolerancing, and assembly drawings.

**MCHT 1013 - Machine Tool Math** – 3 Credit Hours, 75 Contact Hours: This course develops mathematical competencies as applied to machine tool technology. Emphasis is placed on the use of machining formulas by incorporating algebraic, geometric, and trigonometric functions. Topics include machining algebra and geometry, applied geometry, and applied trigonometry.

**MCHT 1119 - Lathe Operations I** – 4 Credit Hours, 90 Contact Hours: Provides opportunities for students to develop skill in the setup and operation of metal cutting lathes. Topics include: safety, lathes parts and controls, lathe tooling and tool bit grinding, lathe calculations, lathe setup and operations.

**MCHT 1120 - Mill Operations I** – 4 Credit Hours, 90 Contact Hours: Provides instruction in the setup and use of the milling machine. Topics include: safety, milling machines, milling machine setup, and milling machine operations.

**MCHT 1219 - Lathe Operations II** – 4 Credit Hours, 90 Contact Hours: Provides further instruction for students to develop skill in the use of lathes. Topics include: lathes, lathe setup, lathe operations, and safety.

**MCHT 1220 - Mill Operations II** – 4 Credit Hours, 90 Contact Hours: Provides further instruction for students to develop skills in the use of milling machines. Topics include: safety, advanced milling calculation, advanced milling machine setup and operations.

**Totals: 26 Credit Hours, 570 Contact Hours**

## General Machinist Apprenticeship OJT Skills / Competency Matrix

hours

### A. Safety and Health skills

Demonstrate good safety practices  
Demonstrate proper techniques for lifting and carrying  
Maintain work area properly  
Safely operate hand tools  
Wear required safety equipment / PPE  
Identify types of fire extinguishers and their proper uses  
Practice fire safety when operating heating equipment or working with hot materials  
Demonstrate safe practices when using powers tools  
Read and interpret SDS and GHS sheets  
Understands and complies with OSHA guidelines and requirements  
Administer first aid and CPR  
Understands the principles and use of Lock-out/tag-out

subtotal 124

### B. Plan Job Process

Determine job specifications  
Identify machining processes  
Estimate job time requirements  
Determine job materials, machines, and tooling  
Determine sequence of processes

subtotal 120

### C. Obtain job resources

Collect job materials  
Determine machine and tooling availability  
Set up job

subtotal 68

### D. Perform Saw / Cut off operations

Select correct saw for the cut  
Properly clamp workpiece in saw  
Insure the saw is set for the material to be cut (blade, feed, speed, etc)  
Perform cutting operations

subtotal 88

### E. Perform Lathe operations

Properly check workpiece in chuck and select proper cutting tool  
Determine and set lathe for proper feed and speeds  
Perform turning operation  
Perform lathe drilling operation  
Perform grooving/parting operation  
Perform lathe threading operation

subtotal 1500

**F. Perform Milling operations**

Determine the proper clamping for the size and shape of the workpiece  
Calculate mill speeds and feeds  
Perform edge milling operations  
Perform face milling operations  
Perform mill drilling operations  
Perform mill boring operations  
Perform mill tapping operations

subtotal 1500

**G. Perform Grinding operations**

Determine grinder holding fixtures  
Obtain grinder holding fixtures  
Determine proper feed rate for material  
Determine appropriate grinding wheel  
Set up grinding wheel  
Perform surface grinding operations

subtotal 600

Target for a 2-year program

4000