

# Machining II

## Course Outcome Summary

Updated November 2022

### Course Information

Total Credits                      3

### Description

Students learn to perform basic trigonometric functions, and perform other procedures such as I.D. boring and facing operations, planning a sequence for machining operations, aligning work pieces, use work holding devices, jigs and fixtures, performing threading operations on lathes, machining keyways on a vertical mill, inspecting and dressing grinding wheels, performing O.D. & I.D. threading operations, performing O.D. & I.D. tapering operations, machining parts using milling cutters and milling machines, and tapping holes on a vertical mill.

### Prerequisites

Machining I

### Exit Learning Outcomes

#### Program Outcomes

- A. Operate machine tool equipment commonly found in industry including manual lathes, milling machines, drill presses and cutting machines
- B. Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings, and shop sketches
- C. Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking
- D. Apply safety principles in a work environment to minimize hazards and prevent losses to productivity
- E. Demonstrate employability skills needed to obtain and retain employment in machine tool and related fields

### Competencies

#### 1. Perform basic trigonometric functions

##### Properties

Domain: Cognitive    Level: Application

##### Linked Program Outcomes

Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking

#### 2. Select cutting tools

##### Properties

Domain: Cognitive    Level: Analysis

##### Linked Program Outcomes

Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines

Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking

Apply safety principles in a work environment to minimize hazards and prevent losses to productivity

**3. Perform I.D. boring and facing operations**

**Properties**

Domain: Psychomotor

**Linked Program Outcomes**

Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines

Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking

Apply safety principles in a work environment to minimize hazards and prevent losses to productivity

Demonstrate employability skills needed to obtain and retain employment in machine tool and related fields

**4. Machine angles using a vertical mill**

**Properties**

Domain: Psychomotor Level:

**Linked Program Outcomes**

Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines

Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches

Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking

Apply safety principles in a work environment to minimize hazards and prevent losses to productivity

Demonstrate employability skills needed to obtain and retain employment in machine tool and related fields

**5. Plan a sequence for milling operations**

**Properties**

Domain: Cognitive Level: Synthesis

**Linked Program Outcomes**

Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines

Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches

Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking

Apply safety principles in a work environment to minimize hazards and prevent losses to productivity

**6. Align work piece, work holding devices, jigs and fixtures on milling machines**

**Properties**

Domain: Psychomotor Level:

**Linked Program Outcomes**

Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines

Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking

Apply safety principles in a work environment to minimize hazards and prevent losses to productivity

Demonstrate employability skills needed to obtain and retain employment in machine tool and related fields

**7. Finish holes using countersinks, counter bores, reamers and taps**

**Properties**

Domain: Psychomotor Level:

**Linked Program Outcomes**

Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines

Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking

Apply safety principles in a work environment to minimize hazards and prevent losses to productivity

Demonstrate employability skills needed to obtain and retain employment in machine tool and related fields

**8. Perform preventive and housekeeping maintenance on a lathe**

**Properties**

Domain: Psychomotor

**Linked Program Outcomes**

Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines

Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking

Apply safety principles in a work environment to minimize hazards and prevent losses to productivity

**9. Perform O.D. and I.D. threading operations**

**Properties**

Domain: Psychomotor

**Linked Program Outcomes**

Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines

Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches

Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking

**10. Perform O.D. and I.D. taper operations**

**Properties**

Domain: Psychomotor

**Linked Program Outcomes**

Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines

Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches

Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking

- 11. Establish zero reference point for work piece to be machined**  
**Properties**  
Domain: Affective Level: Organizing  
**Linked Program Outcomes**  
Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking
- 12. Machine parts using milling cutters and milling machines**  
**Properties**  
Domain: Psychomotor  
**Linked Program Outcomes**  
Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines  
Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches  
Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking
- 13. Tap holes on a vertical mill**  
**Properties**  
Domain: Psychomotor Level:  
**Linked Program Outcomes**  
Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines  
Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches  
Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking
- 14. Machine keyways on a vertical mill**  
**Properties**  
Domain: Psychomotor Level:  
**Linked Program Outcomes**  
Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines  
Manufacture parts from various materials in accordance with specifications from blueprints, electronic drawings and shop sketches  
Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking
- 15. Inspect and dress grinding wheels**  
**Properties**  
Domain: Psychomotor  
**Linked Program Outcomes**  
Operate machine tool equipment commonly found in industry including manual and computer controlled lathes, milling machines, drill presses and cutting machines  
Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking  
Apply safety principles in a work environment to minimize hazards and prevent losses to productivity