Machining II
Course Outcome Summary

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 and computer controlled 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
F. Use CAD and CAM programs to design parts and program manufacturing machines

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**
12. **Properties**  
   **Domain:** Affective   **Level:** Organizing  

**Linked Program Outcomes**  
Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking  

**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. **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  

**Tap holes on a vertical mill**  

14. **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  

**Machine keyways on a vertical mill**  

15. **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  

**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  
 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