Machine Tool Processes
Course Outcome Summary

Course Information

Total Credits 1

Description
Students learn to conduct a job hazard analysis for a machine tool group, analyze blueprints to layout parts and materials, select hand tools and common machine shop mechanical hardware for specific applications, prescribe cutting tools for assigned operations, calculate stock size to minimize drop, machine parts to specifications outlined in machine handbooks, summarize preparations for machining operations, and apply precautions to minimize hazards for work with lathes, mills, drills and grinders.

Prerequisites
OSHA 10 or 30 Safety Course

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. Demonstrateemployability 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. Conduct a job hazard analysis for a machine tool shop
   Properties
   Domain: Psychomotor
   Linked Program Outcomes
   Apply safety principles in a work environment to minimize hazards and prevent losses to productivity
2. Analyze blueprints to layout parts to be machined
   Properties
   Domain: Cognitive  Level: Analysis
   Linked Program Outcomes
   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
3. Select hand tools for assigned applications
   Properties
   Domain: Cognitive   Level: Analysis
   Linked Program Outcomes
   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. Calculate stock size for least amount drop
   Properties
   Domain: Cognitive   Level: Application
   Linked Program Outcomes
   Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking

5. Examine specifications in machinery handbooks needed to machine parts to size
   Properties
   Domain: Cognitive   Level: Application
   Linked Program Outcomes
   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

6. Summarize preparations for machining operations
   Properties
   Domain: Cognitive   Level: Synthesis
   Linked Program Outcomes
   Solve quality problems using process planning, technical knowledge, teamwork, mathematics, and critical thinking
   Demonstrate employability skills needed to obtain and retain employment in machine tool and related fields

7. Select common machine shop mechanical hardware for assigned applications
   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
   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

8. Apply precautions needed to minimize hazards for work with lathes, mills, drills and grinders
   Properties
   Domain: Cognitive   Level: Application
   Linked Program Outcomes
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. **Prescribe cutting tools for assigned operations and applications**

**Properties**
Domain: Cognitive   Level: Evaluation

**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