

Western Technical College

31420327 Machining: Surface Grinding Processes

Course Outcome Summary

Course Information

Description	This course will provide instruction and practice in the use of the manual surface grinder and various surface grinding processes.
Career Cluster	Manufacturing
Instructional Level	Technical Diploma Courses
Total Credits	2
Total Hours	72

Textbooks

No textbook required.

Learner Supplies

Safety glasses with side eye protection that meet Z87 OSHA guidelines. **Vendor:** Campus Shop. Required.

Proper footwear - \$35.00-75.00. **Vendor:** To be discussed in class. Required.

Scientific calculator (recommend T1-36x Solar). **Vendor:** Campus Shop. Required.

Three-ring binder. **Vendor:** Campus Shop. Required.

Clipboard. **Vendor:** Campus Shop. Required.

Pens/Pencils/Black Sharpie Marker. **Vendor:** Campus Shop. Required.

Success Abilities

1. Live Responsibly: Develop Resilience
2. Live Responsibly: Foster Accountability
3. Refine Professionalism: Act Ethically
4. Refine Professionalism: Improve Critical Thinking
5. Refine Professionalism: Practice Effective Communication

Program Outcomes

1. MACH 1. Apply basic safety practices in the machine shop

2. MACH 2. Interpret industrial/engineering drawings
3. MACH 3. Apply precision measuring methods to part inspection
4. MACH 4. Perform basic machine tool equipment set-up and operation

Course Competencies

1. Select grinding wheel for specific applications.

Assessment Strategies

- 1.1. Written Product
- 1.2. Skill Demonstration

Criteria

You will know you are successful when

- 1.1. you select the proper grinding wheel for the specific process at hand.

Learning Objectives

- 1.a. Recognize the difference between grit sizes of wheels.
- 1.b. Interpret identification code on the grinding wheels.
- 1.c. Identify recommended grit size based on project requirements (finishing, roughing, W-P material, etc.)

2. Perform wheel truing/dressing techniques.

Assessment Strategies

- 2.1. Written Product
- 2.2. Skill Demonstration

Criteria

You will know you are successful when

- 2.1. you demonstrate proper wheel truing/dressing techniques.
- 2.2. you describe proper truing/dressing techniques.

Learning Objectives

- 2.a. Dress periphery of the grinding wheel per specifications.
- 2.b. Dress side of the grinding wheel per specifications.

3. Grind work piece surfaces flat and parallel within specified tolerances.

Assessment Strategies

- 3.1. Written Product
- 3.2. Skill Demonstration

Criteria

You will know you are successful when

- 3.1. you use proper infeeds and table movements to grind a surface flat/parallel
- 3.2. you grind two opposing surfaces flat/parallel
- 3.3. you verify that two opposed surfaces are flat/parallel
- 3.4. you take corrective actions to assure that two opposing surfaces are flat/parallel

Learning Objectives

- 3.a. Identify infeeds and table movements for grinding a surface.
- 3.b. Grind surfaces to a specified requirements of surface finish and flatness/parallelism.
- 3.c. Inspect and verify the surface is flat/parallel.
- 3.d. Troubleshoot when surfaces are not flat/parallel within specifications (burrs, cleanliness, W/P condition).

4. Grind adjacent work piece surfaces mutually perpendicular within specified tolerances.

Assessment Strategies

- 4.1. Written Product
- 4.2. Skill Demonstration

Criteria

You will know you are successful when

- 4.1. you grind two surfaces perpendicular to each other.
- 4.2. you grind three or more surfaces mutually perpendicular to each other
- 4.3. you verify that surfaces are perpendicular
- 4.4. you make adjustments to setups to correct perpendicularity

Learning Objectives

- 4.a. Demonstrate setup techniques for grinding a surface perpendicular to another surface.
- 4.b. Demonstrate setup techniques for grinding adjacent surfaces mutually perpendicular.
- 4.c. Inspect and verify that adjacent surfaces are perpendicular.
- 4.d. Troubleshoot when adjacent surfaces are not perpendicular within specifications (burrs, cleanliness, W/P condition).

5. Grind angled surfaces within specified tolerances.

Assessment Strategies

- 5.1. Written Product
- 5.2. Skill Demonstration

Criteria

You will know you are successful when

- 5.1. you grind an angled surface to size and location
- 5.2. you verify the size and location of a ground angle

Learning Objectives

- 5.a. Demonstrate grinding angled surfaces to size and location.
- 5.b. Inspect and verify the surface angles are within tolerances.

6. Grind work piece features to size and location within specified tolerances.

Assessment Strategies

- 6.1. Written Product
- 6.2. Skill Demonstration

Criteria

You will know you are successful when

- 6.1. you create a written plan for grinding work piece features to size and location
- 6.2. you apply inspection techniques while grinding to grind work piece features to size and location
- 6.3. you make adjustments the grinding procedure to make sure work piece features are to size and location when done

Learning Objectives

- 6.a. Prior to grinding, use inspection techniques to determine the amount of material to be removed from each surface to meet specifications.
- 6.b. Apply inspection techniques to verify sizes and locations.
- 6.c. Troubleshoot when features are not within specified size or location (burrs, cleanliness, W/P condition).

7. Troubleshoot problems encountered in surface grinding processes.

Assessment Strategies

- 7.1. Written Product
- 7.2. Skill Demonstration

Criteria

You will know you are successful when

- 7.1. you identify ground surface finish as acceptable or not
- 7.2. you adjust dressing techniques to correct unacceptable surface finish
- 7.3. you adjust infeed and table movements to correct unacceptable surface finish

Learning Objectives

- 7.a. Identify surface finishes that do not meet specifications.
- 7.b. Adjust dressing techniques to correct the surface finish.
- 7.c. Adjust in-feeds and table movements to correct surface finish.