

Western Technical College

31420342 Lathe Turning Operations

Course Outcome Summary

Course Information

Description	This course will provide instruction and practice on the manual engine lathe and various operations performed on it.
Career Cluster	Manufacturing
Instructional Level	One-Year Technical Diploma
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. Interpret the use of turning machine (lathe) components and accessories.

Assessment Strategies

- 1.1. Written Product
- 1.2. Skill Demonstration

Criteria

You will know you are successful when

- 1.1. you identify the location of machine controls, guards, and safety devices.
- 1.2. you operate machine controls, guards, and safety devices.
- 1.3. you describe purpose of turning machine (lathe) components and accessories.

Learning Objectives

- 1.a. Locate all machine components and accessories.
- 1.b. Describe the function of all machine components and accessories..
- 1.c. Recognize and avoid/minimize safety hazards associated with turning machines.
- 1.d. Identify/locate machine guards/safety devices and their purpose.
- 1.e. Identify different types of workholding devices/accessories and their applications.
- 1.f. Recognize which workholding device/accessory will work best for a given turning process/situation.

2. Identify proper tools and toolholding accessories for various turning operations.

Assessment Strategies

- 2.1. Written Product
- 2.2. Skill Demonstration

Criteria

You will know you are successful when

- 2.1. you identify cutting tools used on a turning machine.
- 2.2. you describe the purpose of the selected tool.
- 2.3. you identify types of toolholding accessories used on turning machines.
- 2.4. you change tool inserts based on tool wear.

Learning Objectives

- 2.a. Identify cutting tools that are commonly used on turning machines, and their applications.
- 2.b. Identify types of toolholders commonly used on turning machines.
- 2.c. Recognize indications of tool wear.
- 2.d. Demonstrate proper technique for changing tool inserts.

3. Verify the alignment of turning machine (lathe) components.

Assessment Strategies

- 3.1. Written Product
- 3.2. Skill Demonstration

Criteria

You will know you are successful when

- 3.1. you demonstrate tailstock alignment process.
- 3.2. you demonstrate the process of indicating chuck run out.

Learning Objectives

- 3.a. Recognize the results of tailstock miss-alignment on a work piece.
- 3.b. Demonstrate the process of checking/adjusting tailstock alignment on a lathe.
- 3.c. Recognize the results of chuck run out on a work piece.

- 3.d. Demonstrate the process of checking chuck run out on the lathe.
- 3.e. Recognize (anticipate?) the results of tool post mis-alignment.
- 3.f. Demonstrate the process of aligning the tool post.
- 3.g. Recognize the results of tool mis-alignment.
- 3.h. Demonstrate the process of aligning the tool.

4. Apply appropriate Machining Theory principles to turning machine operation.

Assessment Strategies

- 4.1. Written Product
- 4.2. Skill Demonstration

Criteria

- 4.1. you calculate correct spindle speeds for turning operations
- 4.2. you determine correct feed rates for turning operations
- 4.3. you determine correct infeeds for turning operations
- 4.4. you identify correct cutting fluids for turning operations

Learning Objectives

- 4.a. Calculate spindle speeds.
- 4.b. Determine feed rates to meet surface finish requirements.
- 4.c. Determine infeeds for optimum machining efficiency.
- 4.d. Identify proper cutting fluids for various operations/processes.

5. Operate turning machines according to industry standards.

Assessment Strategies

- 5.1. Skill Demonstration

Criteria

You will know you are successful when

- 5.1. you operate the machine without injury to yourself or others.
- 5.2. you operate the equipment without causing damage to the machine or equipment.
- 5.3. you follow industry safety protocols.
- 5.4. you face a work piece to length
- 5.5. you center drill a work piece
- 5.6. you turn diameters to length
- 5.7. you knurl a work piece
- 5.8. you machine a groove in a work piece
- 5.9. you machine an angle on a work piece with the compound rest
- 5.10. you machine a taper on a work piece with the taper attachment
- 5.11. you machine threads, internal and external, on a work piece
- 5.12. you obtain specified surface finish on a work piece

Learning Objectives

- 5.a. Demonstrate the ability to Face a work piece to length on a lathe.
- 5.b. Demonstrate the ability to Center Drill and perform subsequent hole making operations, on a lathe.
- 5.c. Demonstrate the ability to machine external diameters, to length, on a lathe.
- 5.d. Demonstrate the ability to Knurl on a lathe.
- 5.e. Demonstrate the ability to machine grooves on a lathe.
- 5.f. Demonstrate the ability to set up and machine an angle using the compound rest.
- 5.g. Demonstrate the ability to setup the Taper Attachment on a lathe.
- 5.h. Demonstrate the ability to Bore internal diameters, to length/depth, on a lathe.
- 5.i. Demonstrate the ability to setup and cut external and internal threads on a lathe.
- 5.j. Demonstrate the ability to use a turning machine to produce parts within given tolerances.
- 5.k. Demonstrate the ability to achieve required Surface Finishes on a lathe.
- 5.l. Determine level of accuracy/precision required on workpiece.
- 5.m. Apply work holding devices as required for different turning operations.

6. Determine various thread dimensions and taper information.

Assessment Strategies

- 6.1. Written Product

6.2. Skill Demonstration

Learning Objectives

- 6.a. Use reference materials and tables.
- 6.b. Identify components of a thread callout.
- 6.c. Locate and utilize thread dimensioning tables in Machinery's Handbook.
- 6.d. Use the three wire thread charts to determine dimensions for machining/inspecting various threads.
- 6.e. Locate and utilize various taper charts/tables in the Machinery's Handbook.

7. Use proper workholding devices for turning operations. (EXPIRE)

Assessment Strategies

- 7.1. Written Product
- 7.2. Skill Demonstration

Learning Objectives

- 7.a. Determine level of accuracy/precision required on workpiece. (#5)
- 7.b. Identify different types of workholding devices/accessories and their applications. (#1)
- 7.c. Recognize which workholding device/accessory will work best for a given turning process/situation. (#1)
- 7.d. Apply work holding devices as required for different turning operations. (#5)
- 7.e. These are a combination of #1 and #5. Move as indicated.