



Western Technical College

## 10444222 Programming in CAM for CNC Turning (CBE)

### Course Outcome Summary

#### Course Information

<b>Description</b>	Requires the learner to operate CNC turning centers with programs created with CAM software.
<b>Career Cluster</b>	Manufacturing
<b>Instructional Level</b>	One-Year Technical Diploma
<b>Total Credits</b>	1
<b>Total Hours</b>	36

#### Textbooks

*Mastercam Mill 2D & Lathe Combo*. Copyright 2022. Mastercam. Publisher: Caminstructor Inc. **ISBN-13:** 978-1-988-76679-9. 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.

Minimum 4GB USB Flash Drive. **Vendor:** Campus Shop. Required.

## Success Abilities

1. Cultivate Passion: Increase Self-Awareness
2. Live Responsibly: Foster Accountability
3. Refine Professionalism: Improve Critical Thinking
4. Refine Professionalism: Practice Effective Communication

## Program Outcomes

1. Apply basic safety practices in the machine shop
2. Interpret industrial/engineering drawings
3. Apply precision measuring methods to part inspection
4. Perform programming, set-up and operation of CNC Machine Tools

## Course Competencies

### 1. Create turning features using CAM software.

#### Assessment Strategies

- 1.1. Project

#### Criteria

*You will know you are successful when*

- 1.1. you select the appropriate feature to machine specified part detail.
- 1.2. you create hole features per print specifications and directions.
- 1.3. you create outer diameter turning features per print specifications and directions.
- 1.4. you create inner diameter turning features per print specifications and directions.
- 1.5. you create boring features per print specifications and directions.
- 1.6. you create groove features per print specifications and directions.
- 1.7. you create facing features per print specifications and directions.
- 1.8. you create cutoff features per print specifications and directions.
- 1.9. you create multiple features per print specifications and directions.
- 1.10. you set the appropriate Z offset for turning features.

#### Learning Objectives

- 1.a. Describe the types of turning features that can be created in CAM programs.
- 1.b. Use the turning Features menu.
- 1.c. Create turning features from dimensions.
- 1.d. Create turning features from curves.
- 1.e. Locate turning features in programs.
- 1.f. Set turning feature dimensions.
- 1.g. Select turning feature strategies.

### 2. Write multiple function programs for CNC turning centers.

#### Assessment Strategies

- 2.1. Project

## Criteria

*You will know you are successful when*

- 2.1. you write programs using tool nose radius compensation.
- 2.2. you write programs using G code cutter compensation.
- 2.3. you enter cutter compensation offsets in machine tool per program specifications.
- 2.4. you incorporate at least three tool changes in programs for CNC turning centers.
- 2.5. you incorporate at least two canned cycles in programs for CNC turning centers.
- 2.6. you use G70 and G71 machine cycles in CNC turning center programs.

## Learning Objectives

- 2.a. Write CNC turning center programs with multiple tool changes.
- 2.b. Write CNC turning center programs using tool nose radius compensation.
- 2.c. Write CNC turning center programs that include canned cycles.
- 2.d. Write CNC turning center programs that include G71 and G70 machine cycles .

## 3. Machine parts to prove out programming.

### Assessment Strategies

- 3.1. Project

## Criteria

*You will know you are successful when*

- 3.1. you activate program to run.
- 3.2. you run program in graphical interface or simulator.
- 3.3. you verify accuracy of CNC turning center program.
- 3.4. you identify problems with program.
- 3.5. you correct program errors.
- 3.6. you run programs to cut part or design that was specified.
- 3.7. you inspect part before removing from the machine.

## Learning Objectives

- 3.a. Prepare CNC turning center to run programs.
- 3.b. Call up and activate programs
- 3.c. Verify programs in graphical interface
- 3.d. Correct program errors
- 3.e. Inspect part accuracy