Western Technical College

10606220 Additive Manufacturing (CBE)

Course Outcome Summary

Course Information

Description	Requires the learner to apply additive and subtractive technologies to make complete parts that meet required specifications.
Career Cluster	Marketing
Instructional Level	One-Year Technical Diploma
Total Credits	1
Total Hours	36

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.

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

Success Abilities

1.   Cultivate Passion: Expand a Growth-Mindset

2.   Live Responsibly: Develop Resilience

3.   Live Responsibly: Embrace Sustainability

4.   Refine Professionalism: Improve Critical Thinking

Program Outcomes

1. Apply basic safety practices in the machine shop.

2. Interpret industrial/engineering drawings.

3. Perform programming, set-up and operation of CNC Machine Tools.

Course Competencies

1. Examine types of additive machining processes.

Assessment Strategies
1.1. Product

Learning Objectives
1.a. Research liquid resin layer construction (VAT Photopolymerisation).
1.b. Research material jetting.
1.c. Research binder jetting.
1.d. Research material extrusion.
1.e. Research powder bed fusion.
1.f. Research sheet lamination.
1.g. Research directed energy deposition.
1.h. Identify most common additive machining processes in local businesses/industry.

2. Examine workholding solutions to make non-rigid additive parts machinable.

Assessment Strategies
2.1. Project

Learning Objectives
2.a. Identify common workholding devices that can be used with all materials.
2.b. Research non-standard workholding devices needed for unique parts.
2.c. Research milling and turning recommendations to machine plastic.

3. Identify post-process machining techniques needed for specified tolerances.

Assessment Strategies
3.1. Project

Learning Objectives
3.a. Explore resin removal hardware.
3.b. Examine surface finishing hardware.
3.c. Research types of chemical and other non-machining options.
3.d. Examine CNC machining applications for post-process machining.

4. Machine a 3D printed product to within specified tolerances.

Assessment Strategies
4.1. Project

Learning Objectives
4.a. Apply CNC machining processes to machine a part.
4.b. Apply manual machining processes to machine a part.
4.c. Verify a part's dimensional accuracy.
4.d. Verify surface finish quality.