This Ohio Competency Analysis Profile (OCAP), derived from a modified Developing a Curriculum (DACUM) process, is a current comprehensive and verified employer competency program list for machine trades. Each unit (with or without subunits) contains competencies and competency builders that identify the occupational, academic, and employability skills needed to enter this occupational area. Within that outline are three levels of items: core, advancing, and futuring. Core items are essential to entry-level employment. Advancing items are needed to advance in a given occupation. Futuring items are needed to enter and remain in a given occupation 3 to 4 years from now. This profile contains 18 units: (1) orientation; (2) measuring workpieces; (3) inspecting workpieces; (4) benchwork; (5) layouts; (6) power saws; (7) drilling machines; (8) grinding machines; (9) milling machines; (10) lathes and turning machines; (11) computer numerical controlled (CNC) lathes and turning center; (12) CNC mills and machining center; (13) electrical discharged machines; (14) heat treating; (15) superabrasives; (16) contemporary tooling; (17) advanced machining tooling; and (18) employability skills. (NLA)
Employer Verification Panel

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What is OCAP?

"A comprehensive and verified employer competency list will be developed and kept current for each program." This is the second objective of Imperative 2 of the Action Plan for Accelerating the Modernization of Vocational Education: Ohio’s Future at Work. Ohio’s Competency Analysis Profile (OCAP) lists are the Division of Vocational and Career Education’s response to that objective. OCAP lists evolve from a modified DACUM process involving business, industry, labor, and community agency representatives from throughout Ohio. The OCAP process is directed by the Vocational Instructional Materials Laboratory at The Ohio State University’s Center on Education and Training for Employment.

How is OCAP used?

Each OCAP contains units (with and without subunits), competencies, and competency builders that identify the occupational, academic, and employability skills needed to enter a given occupation or occupational area. Within that outline there are three levels of items: core, advancing, and futuring. Core items are essential to entry-level employment. These items are required to be taught and will be the basis for questions on the state vocational competency tests (scheduled to begin in FY93). Advancing items (marked with one asterisk) are needed to advance in a given occupation. Futuring items (marked with two asterisks) are needed to enter and remain in a given occupation three to four years from now.

Districts may add as many units, subunits, competencies, and competency builders as desired to reflect local employment needs, trends, and specialties. Local advisory committees should be actively involved in the identification and verification of additional items. Using OCAP lists, instructors will be able to formulate their courses of study and monitor competency gains via the new competency testing program.

The Employability Skills portion of this list was verified by the following employer panel:

Gary J. Corrigan, Dana Corporation, Ottawa Lake, Michigan
David Crooks, Bowling Green State University Union Food Service, Bowling Green, Ohio
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Patsy Hathaway, CBS Personnel Services, Inc., Dayton, Ohio
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James Mack, Chrysler Jeep Assembly, Toledo, Ohio
Rocky McCoy, Ironont-Lawrence Co. Community Action Organization, Ironont, Ohio
James Needs, Independent Crop Producer, Upper Sandusky, Ohio
Ronald Simmons, Former GM Executive, Warren Ohio
OHIO COMPETENCY ANALYSIS PROFILE
MACHINE TRADES

UNIT 1: Orientation

COMPETENCY 1.0.1: Use and care for personal safety equipment

COMPETENCY BUILDERS:

1.0.1.1 Wear eye, ear, and respiratory protection according to Occupational Safety and Health Administration (OSHA) specifications
1.0.1.2 Wear proper hand and foot protection according to OSHA specifications
1.0.1.3 Wear appropriate clothing according to OSHA specifications

COMPETENCY 1.0.2: React to fire emergencies according to local fire code

COMPETENCY BUILDERS:

1.0.2.1 Distinguish types of fires
1.0.2.2 Locate fire alarms and exits
1.0.2.3 Locate and demonstrate use of fire blankets and stretchers
1.0.2.4 Locate and demonstrate use of fire extinguishers

COMPETENCY 1.0.3: React to emergency and injury situations

COMPETENCY BUILDERS:

1.0.3.1 Interpret shop safety plan
1.0.3.2 Demonstrate all steps of shop safety plan
1.0.3.3 Identify nature of injury
1.0.3.4 Respond to injury accidents

COMPETENCY 1.0.4: Minimize hazardous situations according to federal and state regulations

COMPETENCY BUILDERS:

1.0.4.1 Maintain clean and safe work stations
1.0.4.2 Read material safety data sheet (MSDS) labels on hazardous materials and follow directions exactly
1.0.4.3 Interpret personal safety rights according to shop's Right-to-Know plan

* Advancing
** Futuring
COMPETENCY 1.0.5: Maintain tools and equipment

COMPETENCY BUILDERS:

1.0.5.1 Perform visual check of grounding and cord condition on all machinery
1.0.5.2 Demonstrate proper care and maintenance procedures for each hand tool and machine and related equipment
1.0.5.3 Check for proper mounting of all safety shields and/or machine guards according to OSHA specifications

UNIT 2: Measuring Workpieces

COMPETENCY 2.0.1: Read different measuring systems

COMPETENCY BUILDERS:

2.0.1.1 Use English system of measurement
2.0.1.2 Use metric system of measurement

COMPETENCY 2.0.2: Select and use measuring tools

COMPETENCY BUILDERS:

2.0.2.1 Identify appropriate applications of measuring tools
2.0.2.2 Use steel rules
2.0.2.3 Use tape measure
2.0.2.4 Use inside diameter (ID), outside diameter (OD), and hermaphrodite calipers
2.0.2.5 Use dividers
2.0.2.6 Use combination square set
2.0.2.7 Use pitch gage
2.0.2.8 Use center gage
2.0.2.9 Use drill point gage
2.0.2.10 Use depth gage
2.0.2.11 Use tool gage
2.0.2.12 Use Acme thread gage
2.0.2.13 Use protractor and depth gage
2.0.2.14 Use Go/No-Go gage
2.0.2.15 Use snap gage
2.0.2.16 Use surface gage
2.0.2.17 Use feeler gage
2.0.2.18 Use combination depth-and-angle gage
2.0.2.19 Use plug-and-ring gage
2.0.2.20 Use taper hole gage
2.0.2.21 Use hole gage
2.0.2.22 Use telescoping gage
2.0.2.23 Use inside micrometer
2.0.2.24 Use outside micrometer
2.0.2.25 Use vernier calipers
2.0.2.26 Use depth micrometer

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(continued)

2.0.2.27 Use cylindrical square
2.0.2.28 Use thread wire
2.0.2.29 Use Jo blocks
2.0.2.30 Use sine bar
2.0.2.31 Use universal bevel protractor
2.0.2.32 Use dial caliper
2.0.2.33 Use indicator
2.0.2.34 Use bore gage
2.0.2.35 Use height micrometer
2.0.2.36 Use special micrometers
2.0.2.37 Use electronic measuring devices
2.0.2.38 Use optical comparator
2.0.2.39 Calibrate and maintain tools

UNIT 3: Inspecting Workpieces

COMPETENCY 3.0.1: Inspect rectangular workpiece according to print specifications, dimensions, and tolerances

COMPETENCY BUILDERS:

3.0.1.1 Select proper measuring devices
3.0.1.2 Check accuracy

COMPETENCY 3.0.2: Inspect round workpiece according to print specifications, dimensions, and tolerances

COMPETENCY BUILDERS:

3.0.2.1 Select proper measuring devices
3.0.2.2 Check accuracy

COMPETENCY 3.0.3: Inspect angular workpieces according to print specifications, dimensions, and tolerances

COMPETENCY BUILDERS:

3.0.3.1 Select proper measuring devices
3.0.3.2 Check accuracy

COMPETENCY 3.0.4: Inspect internal dimensions according to print specifications, dimensions, and tolerances

COMPETENCY BUILDERS:

3.0.4.1 Select proper measuring devices
3.0.4.2 Check accuracy

* Advancing
** Futuring
UNIT 4: Benchwork

COMPETENCY 4.0.1: Use hand tools according to Occupational Safety and Health Administration (OSHA) specifications

COMPETENCY BUILDERS:

4.0.1.1 Follow proper safety and maintenance procedures
4.0.1.2 Use files
4.0.1.3 Tap a through hole
4.0.1.4 Tap a blind hole
4.0.1.5 Cut a thread-die
4.0.1.6 Cut a workpiece with a hacksaw
4.0.1.7 Ream a hole with a hand reamer
4.0.1.8 Select and use chisels
4.0.1.9 Polish a workpiece with grit paper
4.0.1.10 Remove a broken tap
4.0.1.11 Select and install heli-coil
4.0.1.12 Select and use wrenches
4.0.1.13 Select and use hammers
4.0.1.14 Select and use screwdrivers
4.0.1.15 Select and use pin punches
4.0.1.16 Select and use transfer punches
4.0.1.17 Select and use pliers
4.0.1.18 Select and use handstamps
4.0.1.19 Select proper work-holding device
4.0.1.20 Select and use handpress

COMPETENCY 4.0.2: Use power hand tools according to OSHA specifications

COMPETENCY BUILDERS:

4.0.2.1 Follow proper safety and maintenance procedures
4.0.2.2 Drill a hole with a hand drill
4.0.2.3 Use hand grinder
4.0.2.4 Use broaches
4.0.2.5 Select and use presses

* Advancing
** Futuring
UNIT 5: Layouts

COMPETENCY 5.0.1: Perform basic layouts according to print specifications, dimensions, and tolerances

COMPETENCY BUILDERS:

5.0.1.1 Use inside diameter (ID), outside diameter (OD), and hermaphrodite calipers
5.0.1.2 Lay out with combination square
5.0.1.3 Lay out with scriber, divider, and trammel
5.0.1.4 Use surface plate
5.0.1.5 Use surface gage
5.0.1.6 Use layout fluid
5.0.1.7 Use V-blocks
5.0.1.8 Use clamps
5.0.1.9 Use angle plate
5.0.1.10 Use parallels
5.0.1.11 Use punches
5.0.1.12 Use transfer method tools
5.0.1.13 Use layout hammer
5.0.1.14 Use machinist's square

COMPETENCY 5.0.2: Perform precision layouts according to print specifications, dimensions, and tolerances

COMPETENCY BUILDERS:

5.0.2.1 Use surface plate
5.0.2.2 Use surface gage
5.0.2.3 Use sine bar
5.0.2.4 Use Jo blocks
5.0.2.5 Use sine plate*
5.0.2.6 Use sine vise*
5.0.2.7 Use planer gage
5.0.2.8 Use angle-gage blocks*
5.0.2.9 Use indicators
5.0.2.10 Use universal bevel protractor*

UNIT 6: Power Saws

COMPETENCY 6.0.1: Perform preventive maintenance according to manufacturer's specifications

COMPETENCY BUILDERS:

6.0.1.1 Follow proper safety procedures
6.0.1.2 Clean and lubricate power saw
6.0.1.3 Check power saw for wear and alignment

* Advancing
** Futuring
COMPETENCY 6.0.2: Operate power saw according to manufacturer's specifications

COMPETENCY BUILDERS:

6.0.2.1 Select power saw
6.0.2.2 Select proper blade
6.0.2.3 Secure workpiece
6.0.2.4 Weld blade
6.0.2.5 Store blade
6.0.2.6 Install blade
6.0.2.7 Set blade speed and feeds
6.0.2.8 Mount and use attachment
6.0.2.9 Cut a straight line
6.0.2.10 Make an angular saw cut
6.0.2.11 Make an internal saw cut*
6.0.2.12 Make a contour saw cut*

UNIT 7: Drilling Machines

COMPETENCY 7.0.1: Perform preventive maintenance according to manufacturer's specifications

COMPETENCY BUILDERS:

7.0.1.1 Follow proper safety procedures
7.0.1.2 Clean and lubricate drilling machine
7.0.1.3 Check drilling machine for wear and alignment

COMPETENCY 7.0.2: Sharpen drill bit to proper geometry

COMPETENCY BUILDERS:

7.0.2.1 Follow proper safety procedures
7.0.2.2 Select and dress conventional grinding wheel
7.0.2.3 Grind drill bit

COMPETENCY 7.0.3: Mount workpiece securely and safely

COMPETENCY BUILDERS:

7.0.3.1 Select work-holding device
7.0.3.2 Mount and align work-holding device
7.0.3.3 Secure workpiece
COMPETENCY 7.0.4: Operate drilling machine according to manufacturer's specifications

COMPETENCY BUILDERS:

7.0.4.1 Select drilling machine
7.0.4.2 Change feed and speeds
7.0.4.3 Change chuck and sleeve
7.0.4.4 Set up coolants
7.0.4.5 Center drill
7.0.4.6 Drill workpiece to specified size
7.0.4.7 Ream hole
7.0.4.8 Counterbore
7.0.4.9 Countersink
7.0.4.10 Spot face
7.0.4.11 Angle drill
7.0.4.12 Spade drill
7.0.4.13 Power tap
7.0.4.14 Use boring head*
7.0.4.15 Deburr and polish
7.0.4.16 Hone and lap

UNIT 8: Grinding Machines

COMPETENCY 8.0.1: Perform preventive maintenance according to manufacturer's specifications

COMPETENCY BUILDERS:

8.0.1.1 Follow proper safety procedures
8.0.1.2 Clean and lubricate grinding machine
8.0.1.3 Check grinding machine for wear and alignment

COMPETENCY 8.0.2: Set up grinding machine according to manufacturer's specifications

COMPETENCY BUILDERS:

8.0.2.1 Select grinding machine
8.0.2.2 Select conventional grinding wheel
8.0.2.3 Mount, true, dress, and balance grinding wheel
8.0.2.4 Select work-holding device
8.0.2.5 Mount work-holding device
8.0.2.6 Mount and secure workpiece

* Advancing
** Futuring
COMPETENCY 8.0.3: Operate grinding machines according to manufacturer's specifications

COMPETENCY BUILDERS:

8.0.3.1 Operate pedestal and/or bench grinder
8.0.3.2 Operate outside diameter (OD) and/or inside diameter (ID) grinder*
8.0.3.3 Operate surface grinder
8.0.3.4 Operate tool and cutter grinder
8.0.3.5 Operate lapping machine*
8.0.3.6 Operate honing machine*
8.0.3.7 Operate belt disc sander

UNIT 9: Milling Machines

COMPETENCY 9.0.1: Perform preventive maintenance according to manufacturer's specifications

COMPETENCY BUILDERS:

9.0.1.1 Follow proper safety procedures
9.0.1.2 Clean and lubricate milling machine
9.0.1.3 Check milling machine for wear and alignment

COMPETENCY 9.0.2: Set up milling machine according to manufacturer's specifications

COMPETENCY BUILDERS:

9.0.2.1 Select milling machine
9.0.2.2 Indicate head
9.0.2.3 Select conventional cutter
9.0.2.4 Mount tool holders and tools
9.0.2.5 Select speeds and feeds
9.0.2.6 Select and indicate work-holding device
9.0.2.7 Mount work-holding device
9.0.2.8 Mount and secure workpiece
9.0.2.9 Select cutting fluids

* Advancing
** Futuring
COMPETENCY 9.0.3: Perform milling operations according to print specifications, dimensions, and tolerances

COMPETENCY BUILDERS:

9.0.3.1 Use edge finder and wiggler
9.0.3.2 Mill flat surfaces
9.0.3.3 Use power feed accessories
9.0.3.4 Mill a key way
9.0.3.5 Perform climb and conventional milling
9.0.3.6 Index work with dividing head
9.0.3.7 Center drill and drill hole on a vertical mill
9.0.3.8 Bore hole with boring head
9.0.3.9 Mill an angular surface
9.0.3.10 Mill a dovetail
9.0.3.11 Tap workpiece
9.0.3.12 Ream workpiece
9.0.3.13 Plane mill
9.0.3.14 Gang mill
9.0.3.15 Straddle mill
9.0.3.16 Form mill*
9.0.3.17 Use rotary table*
9.0.3.18 Use angle plate*
9.0.3.19 Use sine plate*
9.0.3.20 Cut gears*

UNIT 10: Lathes and Turning Machines

COMPETENCY 10.0.1: Perform preventive maintenance according to manufacturer's specifications

COMPETENCY BUILDERS:

10.0.1.1 Follow proper safety procedures
10.0.1.2 Clean and lubricate lathe and turning machine
10.0.1.3 Check lathe and turning machine for wear and alignment

COMPETENCY 10.0.2: Grind cutting tool to specified geometry

COMPETENCY BUILDERS:

10.0.2.1 Select proper grinding machine and wheel type
10.0.2.2 Select tool blank
10.0.2.3 Grind tool blank to proper geometry

* Advancing  ** Futuring
COMPETENCY 10.0.3: Set up turning operations according to manufacturer's specifications

10.0.3.1 Select lathes
10.0.3.2 Select work-holding device
10.0.3.3 Mount work-holding device
10.0.3.4 Mount and secure workpiece
10.0.3.5 Set up and mount tool holders
10.0.3.6 Select feeds and speeds

COMPETENCY 10.0.4: Operate turning operations according to print specifications, dimensions, and tolerances

COMPETENCY BUILDERS:

10.0.4.1 Mount and true workpiece in 3-jaw and 4-jaw chucks
10.0.4.2 Mount workpiece between centers
10.0.4.3 Mount workpiece on face plate
10.0.4.4 Install and mount workpiece in collets
10.0.4.5 Align centers
10.0.4.6 Face workpiece
10.0.4.7 Turn outside diameter
10.0.4.8 Turn workpiece to shoulder
10.0.4.9 Turn inside diameter (ID) and outside diameter (OD) taper
10.0.4.10 Knurl workpiece
10.0.4.11 Cut off workpiece with parting tool
10.0.4.12 Cut with forming tool
10.0.4.13 Bore inside diameters
10.0.4.14 Cut right-hand and left-hand threads (ID and OD)
10.0.4.15 Center drill and drill workpiece
10.0.4.16 Use steady rests
10.0.4.17 Use follower rest
10.0.4.18 Ream workpiece
10.0.4.19 Counterbore
10.0.4.20 Countersink
10.0.4.21 Chamfer
10.0.4.22 File and polish workpiece
10.0.4.23 Cut a double-lead screw
10.0.4.24 Use miscellaneous stops

COMPETENCY 10.0.5: Mount tools and set up turret turning machine according to manufacturer's specifications

COMPETENCY BUILDERS:

10.0.5.1 Select tool sequence
10.0.5.2 Check swing radius for tool clearance
UNIT 11: Computer Numerical Controlled (CNC) Lathes and Turning Center

COMPETENCY 11.0.1: Perform preventive maintenance according to manufacturer's specifications

COMPETENCY BUILDERS:
11.0.1.1 Follow proper safety procedures
11.0.1.2 Clean and lubricate CNC equipment
11.0.1.3 Check CNC equipment for wear and alignment

COMPETENCY 11.0.2: Prepare program according to print specifications, dimensions, and tolerances

COMPETENCY BUILDERS:
11.0.2.1 Write a program manually in word address format
11.0.2.2 Write a program manually in conversational program with CAD/CAM systems
11.0.2.3 Program at machine using manual data input (MDI) process

COMPETENCY 11.0.3: Load program and set up machine according to manufacturer's specifications

COMPETENCY BUILDERS:
11.0.3.1 Load program from MDI and off-line programming station
11.0.3.2 Select, mount, and prepare work-holding device
11.0.3.3 Mount and secure workpiece
11.0.3.4 Set up reference and clearance points
11.0.3.5 Select and mount tooling
11.0.3.6 Set tooling

COMPETENCY 11.0.4: Manufacture workpiece according to print specifications, dimensions, and tolerances

COMPETENCY BUILDERS:
11.0.4.1 Dry-run machine
11.0.4.2 Run part
11.0.4.3 Inspect part

* Advancing
** Futuring
UNIT 12: Computer Numerical Controlled (CNC) Mills and Machining Center

COMPETENCY 12.0.1: Perform preventive maintenance according to manufacturer's specifications

COMPETENCY BUILDERS:

12.0.1.1 Follow proper safety procedures
12.0.1.2 Clean and lubricate CNC equipment
12.0.1.3 Check CNC equipment for wear and alignment

COMPETENCY 12.0.2: Prepare program according to print specifications, dimensions, and tolerances

COMPETENCY BUILDERS:

12.0.2.1 Write a program manually in word address format
12.0.2.2 Write a program manually in conversational program with CAD/CAM system*

COMPETENCY 12.0.3: Load program and set up machine according to manufacturer's specifications

COMPETENCY BUILDERS:

12.0.3.1 Load program from manual data input (MDI) and off-line programming station
12.0.3.2 Set up reference and clearance points
12.0.3.3 Select work-holding device
12.0.3.4 Mount and indicate work-holding device
12.0.3.5 Mount and secure workpiece
12.0.3.6 Select and mount tooling
12.0.3.7 Set tooling

COMPETENCY 12.0.4: Manufacture workpiece according to print specifications, dimensions, and tolerances

COMPETENCY BUILDERS:

12.0.4.1 Dry-run machine
12.0.4.2 Run part
12.0.4.3 Inspect part

* Advancing
** Futuring
UNIT 13: Electrical Discharge Machines (EDMs)

COMPETENCY 13.0.1: Perform preventive maintenance according to manufacturer's specifications

COMPETENCY BUILDERS:
13.0.1.1 Follow proper safety procedures
13.0.1.2 Clean and lubricate EDM
13.0.1.3 Check EDM for wear and alignment

COMPETENCY 13.0.2: Select and prepare electrodes according to manufacturer's specifications

COMPETENCY BUILDERS:
13.0.2.1 Select electrode material
13.0.2.2 Machine electrode

COMPETENCY 13.0.3: Set up machine according to manufacturer's specifications

COMPETENCY BUILDERS:
13.0.3.1 Mount electrode
13.0.3.2 Select work-holding device
13.0.3.3 Mount work-holding device
13.0.3.4 Mount and secure workpiece
13.0.3.5 Set machine controls to workpiece and electrode specifications

COMPETENCY 13.0.4: Operate EDM according to print specifications, dimensions, and tolerances

COMPETENCY BUILDERS:
13.0.4.1 Adjust dielectric fluid
13.0.4.2 Set flushing pressure
13.0.4.3 Spark-in electrode
13.0.4.4 Run part
13.0.4.5 Inspect part

UNIT 14: Heat Treating

COMPETENCY 14.0.1: Perform preventive maintenance according to manufacturer's specifications

COMPETENCY BUILDERS:
14.0.1.1 Follow proper safety procedures
14.0.1.2 Clean and inspect heat-treating equipment
14.0.1.3 Check quenching tank for coolant type and level

* Advancing
** Futuring
COMPETENCY 14.0.2: Operate heat-treating equipment according to manufacturer's specifications and print specifications, dimensions, and tolerances

COMPETENCY BUILDERS:
14.0.2.1 Harden and temper carbon steel workpiece
14.0.2.2 Flame-harden workpiece
14.0.2.3 Case-harden low carbon workpiece
14.0.2.4 Anneal workpiece
14.0.2.5 Normalize workpiece
14.0.2.6 Test workpiece for hardness

UNIT 15: Superabrasives

COMPETENCY 15.0.1: Grind with superabrasives

COMPETENCY BUILDERS:
15.0.1.1 Set up and operate grinding machine with diamond wheel
15.0.1.2 Set up and operate grinding machine with cubic boron nitride (CBN) wheel

COMPETENCY 15.0.2: Machine with superabrasives

COMPETENCY BUILDERS:
15.0.2.1 Set up and operate lathe with polycrystalline diamond (PCD) tool
15.0.2.2 Set up and operate lathe with polycubic boron nitride (PCBN) tool

UNIT 16: Contemporary Tooling

COMPETENCY 16.0.1: Perform turning operations with indexable tooling according to manufacturer's specifications

COMPETENCY BUILDERS:
16.0.1.1 Select tool holder and insert according to American National Standards Institute (ANSI) and International Standards Organization (ISO) standards
16.0.1.2 Set up and operate turning machine with indexable tooling

* Advancing
** Futuring
COMPETENCY 16.0.2: Perform milling operations with indexable tooling according to manufacturer's specifications

COMPETENCY BUILDERS:

16.0.2.1 Select cutter body and insert(s) according to ANSI and ISO standards
16.0.2.2 Set up and operate milling machine with indexable tooling

COMPETENCY 16.0.3: Preset tooling according to manufacturer's specifications

COMPETENCY BUILDERS:

16.0.3.1 Calibrate presetting equipment
16.0.3.2 Preset tooling

UNIT 17: Advanced Machining Technology

COMPETENCY 17.0.1: Investigate wire electrical discharge machines (EDMs)

COMPETENCY BUILDERS:

17.0.1.1 Identify wire EDM applications
17.0.1.2 Illustrate operational principles

COMPETENCY 17.0.2: Investigate laser cutting machines

COMPETENCY BUILDERS:

17.0.2.1 Identify laser cutting machine applications
17.0.2.2 Illustrate operational principles

COMPETENCY 17.0.3: Investigate plasma arc cutting

COMPETENCY BUILDERS:

17.0.3.1 Identify plasma arc cutting applications
17.0.3.2 Illustrate operational principles

COMPETENCY 17.0.4: Investigate water-jet cutting

COMPETENCY BUILDERS:

17.0.4.1 Identify water-jet cutting applications
17.0.4.2 Illustrate operational principles

* Advancing
** Futuring
COMPETENCY 17.0.5: Investigate automated manufacturing

COMPETENCY BUILDERS:
17.0.5.1 Identify automated manufacturing
17.0.5.2 Illustrate operational principles

UNIT 18: Employability Skills

SUBUNIT 18.1: Career Development

COMPETENCY 18.1.1: Investigate career options

COMPETENCY BUILDERS:
18.1.1.1 Determine interests and aptitudes
18.1.1.2 Identify career options
18.1.1.3 Research occupations matching interests and aptitudes
18.1.1.4 Select career(s) that best match(es) interests and aptitudes
18.1.1.5 Identify advantages and disadvantages of career options, including nontraditional careers
18.1.1.6 Assess differences in wages, annual incomes, and job opportunities based on geographic location
18.1.1.7 Develop a career plan

COMPETENCY 18.1.2: Analyze potential barriers to employment

COMPETENCY BUILDERS:
18.1.2.1 Identify common barriers to employment
18.1.2.2 Develop strategies to overcome employment barriers

UNIT 18: Employability Skills

SUBUNIT 18.2: Decision Making and Problem Solving

COMPETENCY 18.2.1: Apply decision-making techniques in the workplace

COMPETENCY BUILDERS:
18.2.1.1 Identify the decision to be made
18.2.1.2 Compare alternatives
18.2.1.3 Determine consequences of each alternative
18.2.1.4 Make decisions based on values and goals
18.2.1.5 Evaluate the decision made
COMPETENCY 18.2.2: Apply problem-solving techniques in the workplace

COMPETENCY BUILDERS:

18.2.2.1 Diagnose the problem and its causes
18.2.2.2 Identify alternatives and their consequences in relation to the problem
18.2.2.3 Examine multicultural and nonsexist dimensions of problem solving
18.2.2.4 Utilize resources to explore possible solutions to the problem
18.2.2.5 Compare and contrast the advantages and disadvantages of each solution
18.2.2.6 Determine appropriate action
18.2.2.7 Evaluate results

UNIT 18: Employability Skills

SUBUNIT 18.3: Work Ethic

COMPETENCY 18.3.1: Evaluate the relationship of self-esteem to work ethic

COMPETENCY BUILDERS:

18.3.1.1 Identify special characteristics and abilities in self and others
18.3.1.2 Identify internal and external factors that affect self-esteem

COMPETENCY 18.3.2: Analyze the relationship of personal values and goals to work ethic both in and out of the workplace

COMPETENCY BUILDERS:

18.3.2.1 Distinguish between values and goals
18.3.2.2 Determine the importance of values and goals
18.3.2.3 Evaluate how values affect goals
18.3.2.4 Identify short-term and long-term goals
18.3.2.5 Prioritize personal goals
18.3.2.6 Describe how personal values are reflected in work ethic
18.3.2.7 Describe how interactions in the workplace affect personal work ethic
18.3.2.8 Examine how life changes affect personal work ethic

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COMPETENCY 18.3.3: Demonstrate work ethic

COMPETENCY BUILDERS:

18.3.3.1 Examine factors that influence work ethic
18.3.3.2 Exhibit characteristics that reflect an appropriate work ethic

UNIT 18: Employability Skills

SUBUNIT 18.4: Job-Seeking Skills

COMPETENCY 18.4.1: Prepare for employment

COMPETENCY BUILDERS:

18.4.1.1 Identify traditional and nontraditional employment sources
18.4.1.2 Utilize employment sources
18.4.1.3 Research job opportunities, including nontraditional careers
18.4.1.4 Interpret equal employment opportunity laws
18.4.1.5 Explain the critical importance of personal appearance, hygiene, and demeanor throughout the employment process
18.4.1.6 Prepare for generic employment tests and those specific to an occupation/organization

COMPETENCY 18.4.2: Design a résumé

COMPETENCY BUILDERS:

18.4.2.1 Identify personal strengths and weaknesses
18.4.2.2 List skills and/or abilities, career objective(s), accomplishments/achievements, educational background, and work experience
18.4.2.3 Demonstrate legible written communication skills using correct grammar, spelling, and concise wording
18.4.2.4 Complete résumé using various formats
18.4.2.5 Secure references

COMPETENCY 18.4.3: Complete and process job application forms

COMPETENCY BUILDERS:

18.4.3.1 Explain the importance of an application form
18.4.3.2 Identify ways to obtain job application forms
18.4.3.3 Describe methods for handling illegal questions on job application forms
18.4.3.4 Demonstrate legible written communications skills using correct grammar, spelling, and concise wording
18.4.3.5 Return application to proper person, request interview, and follow up
COMPETENCY 18.4.4: Demonstrate interviewing skills

COMPETENCY BUILDERS

18.4.4.1 Investigate interview environment and procedures
18.4.4.2 Explain the critical importance of personal appearance, hygiene, and demeanor
18.4.4.3 Demonstrate question and answer techniques
18.4.4.4 Demonstrate methods for handling difficult and/or illegal interview questions

COMPETENCY 18.4.5: Secure employment

COMPETENCY BUILDERS:

18.4.5.1 Identify present and future employment opportunities within an occupation/organization
18.4.5.2 Research the organization/company
18.4.5.3 Use follow-up techniques to enhance employment potential
18.4.5.4 Compare and evaluate job offers

UNIT 18: Employability Skills

SUBUNIT 18.5: Job Retention Skills

COMPETENCY 18.5.1: Analyze the organizational structure of the workplace

COMPETENCY BUILDERS:

18.5.1.1 Identify and evaluate employer expectations regarding job performance, work habits, attitudes, personal appearance, and hygiene
18.5.1.2 Be aware of and obey all company policies and procedures
18.5.1.3 Examine the role/relationship between employee and employer
18.5.1.4 Recognize opportunities for advancement and reasons for termination

COMPETENCY 18.5.2: Maintain positive relations with others

COMPETENCY BUILDERS:

18.5.2.1 Exhibit appropriate work habits and attitude
18.5.2.2 Identify behaviors to establish successful working relationships
18.5.2.3 Cooperate and compromise through teamwork and group participation
18.5.2.4 Identify alternatives for dealing with harassment, bias, and discrimination based on race, color, national origin, sex, religion, handicap, or age

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UNIT 18: Employability Skills

SUBUNIT 18.6: Job Advancement

COMPETENCY 18.6.1: Analyze opportunities for personal and career growth

COMPETENCY BUILDERS:

18.6.1.1 Determine opportunities within an occupation/organization
18.6.1.2 Compare and contrast other opportunities
18.6.1.3 List benefits of job advancement
18.6.1.4 Evaluate factors involved when assuming a new position within or outside an occupation/organization

COMPETENCY 18.6.2: Exhibit characteristics needed for advancement

COMPETENCY BUILDERS:

18.6.2.1 Display a positive attitude
18.6.2.2 Demonstrate knowledge of a position
18.6.2.3 Perform quality work
18.6.2.4 Adapt to changing situations and technology
18.6.2.5 Demonstrate capability for different positions
18.6.2.6 Participate in continuing education/training programs
18.6.2.7 Respect, accept, and work with ALL individuals in the workplace

UNIT 18: Employability Skills

SUBUNIT 18.7: Technology in the Workplace

COMPETENCY 18.7.1: Assess the impact of technology in the workplace

COMPETENCY BUILDERS:

18.7.1.1 Cite how past business/industry practices have influenced present business/industry processes
18.7.1.2 Investigate the use of technology in the workplace
18.7.1.3 Analyze how present skills can be applied to learning new technologies

COMPETENCY 18.7.2: Use a variety of technological applications

COMPETENCY BUILDERS:

18.7.2.1 Explore basic mathematical, scientific, computer, and technological principles
18.7.2.2 Use technology to accomplish assigned tasks
18.7.2.3 Create solutions to problems using technical means

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UNIT 18: Employability Skills

SUBUNIT 18.8: Lifelong Learning

COMPETENCY 18.8.1: Apply lifelong learning to individual situations

COMPETENCY BUILDERS:
18.8.1.1 Define lifelong learning
18.8.1.2 Identify factors that cause the need for lifelong learning

COMPETENCY 18.8.2: Adapt to change

COMPETENCY BUILDERS:
18.8.2.1 Analyze the effects of change
18.8.2.2 Identify reasons why goals change
18.8.2.3 Describe the importance of flexibility when reevaluating goals
18.8.2.4 Evaluate the need for continuing education/training

UNIT 18: Employability Skills

SUBUNIT 18.9: Economic Education

COMPETENCY 18.9.1: Analyze global enterprise systems

COMPETENCY BUILDERS:
18.9.1.1 Identify characteristics of various enterprise systems
18.9.1.2 Examine the relationship between competition, risk, and profit
18.9.1.3 Illustrate how supply and demand influence price

COMPETENCY 18.9.2: Evaluate personal money management

COMPETENCY BUILDERS:
18.9.2.1 Describe the need for personal management records
18.9.2.2 Identify methods of taxation
18.9.2.3 Analyze how credit affects financial security
18.9.2.4 Compare types and methods of investments
18.9.2.5 Prepare a personal budget
18.9.2.6 Be an informed and responsible consumer
18.9.2.7 Analyze the effects of advertising on the consumer

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UNIT 18: Employability Skills

SUBUNIT 18.10: Balancing Work and Family

COMPETENCY 18.10.1: Analyze the effects of family on work

COMPETENCY BUILDERS:

18.10.1.1 Recognize how family values, goals, and priorities are reflected in the workplace
18.10.1.2 Identify present and future family structures and responsibilities
18.10.1.3 Describe personal and family roles
18.10.1.4 Analyze concerns of working parent(s)
18.10.1.5 Examine how family responsibilities can conflict with work
18.10.1.6 Resolve family-related conflicts
18.10.1.7 Explain how to use support systems/community resources to help resolve family-related conflicts

COMPETENCY 18.10.2: Analyze the effects of work on family

COMPETENCY BUILDERS:

18.10.2.1 Identify responsibilities associated with paid and nonpaid work
18.10.2.2 Compare the advantages and disadvantages of multiple incomes
18.10.2.3 Examine how work can conflict with family responsibilities
18.10.2.4 Describe how work-related stress can affect families
18.10.2.5 Identify family support systems and resources

UNIT 18: Employability Skills

SUBUNIT 18.11: Citizenship in the Workplace

COMPETENCY 18.11.1: Exercise the rights and responsibilities of citizenship in the workplace

COMPETENCY BUILDERS:

18.11.1.1 Identify the basic rights and responsibilities of citizenship
18.11.1.2 Examine the history and contributions of all racial, ethnic, and cultural groups
COMPETENCY 18.11.2: Cooperate with others in the workplace

COMPETENCY BUILDERS:
18.11.2.1 Identify situations in which compromise is necessary
18.11.2.2 Examine how individuals from various backgrounds contribute to work-related situations
18.11.2.3 Demonstrate initiative to facilitate cooperation
18.11.2.4 Give and receive constructive criticism to enhance cooperation

UNIT 18: Employability Skills

SUBUNIT 18.12: Leadership

COMPETENCY 18.12.1: Evaluate leadership styles appropriate for the workplace

COMPETENCY BUILDERS:
18.12.1.1 Identify characteristics of effective leaders
18.12.1.2 Compare leadership styles
18.12.1.3 Demonstrate effective delegation skills
18.12.1.4 Identify opportunities to lead in the workplace

COMPETENCY 18.12.2: Demonstrate effective teamwork skills

COMPETENCY BUILDERS:
18.12.2.1 Identify the responsibilities of a valuable group member
18.12.2.2 Exhibit open-mindedness
18.12.2.3 Identify methods of involving each member of a team
18.12.2.4 Contribute to the efficiency and success of a group
18.12.2.5 Determine ways to motivate others

COMPETENCY 18.12.3: Utilize effective communication skills

COMPETENCY BUILDERS:
18.12.3.1 Demonstrate the importance of listening
18.12.3.2 Demonstrate assertive communication
18.12.3.3 Recognize the importance of verbal and nonverbal cues and messages
18.12.3.4 Analyze written material
18.12.3.5 Prepare written material
18.12.3.6 Give and receive feedback
18.12.3.7 Articulate thoughts
18.12.3.8 Use appropriate language
UNIT 18: Employability Skills

SUBUNIT 18.13: Entrepreneurship

COMPETENCY 18.13.1: Evaluate the role of small business in the economy

COMPETENCY BUILDERS:

18.13.1.1 Identify the benefits of small business to a community
18.13.1.2 Analyze opportunities for small business in a community

COMPETENCY 18.13.2: Examine considerations of starting a business

COMPETENCY BUILDERS:

18.13.2.1 Research a business idea
18.13.2.2 Compare various ways to become a small business owner
18.13.2.3 Investigate factors to consider in financing a new business
18.13.2.4 Evaluate entrepreneurship as a career option
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