

**Competency Task List – Secondary Component**  
**Machine Tool Technology/Machinist CIP 48.0501**  
**High School Graduation Years 2022, 2023, 2024**

**100 Orientation and Safety**

- 101 Follow Occupational Safety and Health Administration (OSHA) regulations.
- 102 RESERVED
- 103 Apply general shop safety procedures (e.g., utilize PPE, safe machine operation, safe use of hand tools, power tools, fire safety, safe work areas)
- 104 RESERVED Follow required procedures for emergency situations (e.g. contacting 911)
- 105 RESERVED
- 106 Follow Safety Data Sheets (SDS). Demonstrate understanding and use of SDS
- 107 RESERVED
- 108 Apply safety procedures outlined by machine manuals.

**200 Performing Layout Work**

- 201 Perform layout work, completing NIMS layout projects.
- 202 RESERVED
- 203 RESERVED Employ basic and precision layout tools (e.g. process planning, SPC charts, sampling plans).

**300 Part Inspection**

- 301 Use precision measuring instruments.
- 302 Calibrate precision measuring instruments.
- 303 Create quality control procedures.

**400 Bench Work**

- 401 Apply bench work safety procedures.
- 402 Cut material with a hand hacksaw.
- 403 File work to specifications.
- 404 Cut threads with hand taps and dies.
- 405 RESERVED
- 406 Select and use hand tools.
- 407 Use a hand arbor and hydraulic press.
- 408 Complete NIMS benchwork project.

**500 Drill Presses**

- 501 Apply drill press safety procedures.
- 502 Operate drill press work holding devices.
- 503 RESERVED
- 504 RESERVED
- 505 Select correct drill sizes for drill press application.
- 506 RESERVED
- 507 Demonstrate counterboring, spotfacing, reaming, and countersinking, and tapping.
- 508 RESERVED
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- 511 RESERVED
- 512 Complete the NIMS Drill Press Project.

**600 Grinding Machines**

- 601 Apply pedestal and surface grinding safety procedures.
- 602 Identify parts of pedestal grinder.
- 603 Test, mount, and dress grinding wheels.
- 604 Grind and sharpen tools.
- 605 RESERVED
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- 608 Identify parts of surface grinder.
- 609 Grind surfaces flat and parallel using a magnetic chuck.
- 610 Grind work surfaces square with a vise or angle plate.
- 611 Grind precision angles using a sine plate or sine bar.
- 612 Complete the NIMS Grinding Project.

**700 Lathes**

- 701 Apply lathe safety procedures.
- 702 Indicate work piece in a 4-jaw chuck.
- 703 Align centers.
- 704 Face workpiece.
- 705 RESERVED
- 706 Turn inside and outside diameters to shoulders.

- 707 Turn tapers.
- 708 Demonstrate knurling.
- 709 Part off and groove workpiece.
- 710 Cut internal and external threads.
- 711 RESERVED
- 712 File and polish workpiece.
- 713 RESERVED
- 714 Perform boring operations.
- 715 Install and remove tool holders.
- 716 Select and apply work holding devices.
- 717 RESERVED
- 718 RESERVED
- 719 Select gears for lathe operations.
- 720 Perform drilling operations.
- 721 Complete the NIMS Lathe Project.

#### **800 Milling Machines**

- 801 Apply milling machine safety procedures.
- 802 Tram a mill head.
- 803 Mount and indicate vise.
- 804 Mill angles.
- 805 Mill keyways.
- 806 RESERVED Perform hole making including drilling and tapping operations.
- 807 RESERVED
- 808 RESERVED
- 809 Use an edge finder.
- 810 Differentiate between climb milling and conventional milling.
- 811 Use an adjustable boring head.
- 812 RESERVED
- 813 Install and remove cutting tool holders.
- 814 Select cutting tool for milling operations.
- 815 Square part.
- 816 Select cutting tool for drilling operations.
- 817 Complete the NIMS Milling Project.

#### **900 Power Saw**

- 901 Apply power saw safety procedures.
- 902 RESERVED
- 903 RESERVED
- 904 Follow the 3 tooth rule.
- 905 Saw work piece.
- 906 RESERVED

#### **1000 Machines and Tools**

- 1001 Lubricate and maintain machinery.
- 1002 Clean and store equipment.
- 1003 Inspect machine guards.
- 1004 RESERVED Identify and perform periodic preventative maintenance.
- 1005 RESERVED Adhere to basic safety practices.

#### **1100 Metallurgy**

- 1101 Identify metals classifications.
- 1102 Identify metal property applications.
- 1103 Identify heat-treating and annealing processes.

#### **1200 Charts and References**

- 1201 Use the decimal equivalent chart.
- 1202 Calculate speeds and feeds.
- 1203 Use tap and drill charts.
- 1204 Use Machinery handbook and/or shop references to locate information.

#### **1300 Blue Print Reading**

- 1301 Identify orthographic views and projections.
- 1302 RESERVED Identify GD&T
- 1303 Identify the alphabet of lines and symbols.
- 1304 RESERVED
- 1305 Calculate material sizes.
- 1306 Differentiate angle projections.
- 1307 RESERVED

1308 Interpret title block information.

**1400 CNC Programming/Operations/CNC Set Up/CNC Operating**

1401 Apply CNC safety procedures.

1402 Interpret G and M codes.

1403 RESERVED **Complete the CNC NIMS lathe project.**

1404 Use Cartesian coordinate systems.

1405 RESERVED **Complete the CNC Mill project.**

1406 Prove a CNC program.

1407 RESERVED **Apply tool holding and workholding.**

1408 RESERVED **Complete NIMS programming project.**

1409 Set part zero and tool offsets.

1410 Transfer data files to and from a CNC machine.

1411 Use CNC control functions.

1412 RESERVED

1413 Select and use workholding devices.