

## **SCREW MACHINE SET UP AND OPERATOR (MULTIPLE SPINDLE)**

O\*NET CODE 51-4034.00

This training outline is a minimum standard for Work Processes and Related Instruction. Changes in technology and regulations may result in the need for additional on-the-job or classroom training.

### **WORK PROCESSES**

	<b>Approximate Hours</b>
<b>A. First Phase – At Machine</b>	<b>1,000</b>
1. Familiarization with machine – explanation and demonstration of principles, mechanisms, controls.	
a. Shop safety	
b. Housekeeping including shop cleanliness, handling of parts, cleaning out machines, chip disposal, etc.	
c. Stocking machines	
d. Machine lubrication	
e. Basic blueprint reading	
f. Inspection of parts	
g. Begin basic training on tool sharpening using pedestal surface grinders	
h. Learn screw machine nomenclature	
i. Become familiar with the various types of cutting tools and tool holders used in machining metals	
<b>B. Second Phase – At Machine</b>	<b>1,000</b>
1. Learn responsibility of the operator to maintain maximum production of good parts, constantly checking work against blueprint, keeping machine stocked up.	
a. Continue prior instruction and practice	
b. Under supervision, change feed fingers and adjust tension on various styles of feed fingers	
c. Under supervision, change collets and adjust tension or collets	
d. Learn what each tool does on the job	
e. Make minor adjustments when directed	
f. As directed remove tools from machine for sharpening or replacement	

- g. Under supervision sharpen tools and reset in machine

**C. Third Phase – At Machine 1,000**

1. Intermediate machine operation
  - a. Continue prior instruction and practice
  - b. More instruction and practice in sharpening such tools as forms, shave, cut-off, and box tools
  - c. Actively assist lead operator in removal, sharpening and resetting of various tools used
  - d. Instruction and practice in use of drill and tap grinding machines
  - e. Learn to adjust brake, locating lever, starting clutch, high speed clutch
  - f. Change roll clutch as needed
  - g. Change spindle speed and feed gears
  - h. Begin to recognize and analyze problems and make corrections on own

**D. Fourth Phase – At Machine**

**1,000**

1. Intermediate Operation and Analyzing Minor Job Problems
  - a. Continue prior instruction and practice
  - b. Operate and maintain simple jobs on own
  - c. Sharpen tools or change tools and reset as required
  - d. Remove jobs from machines and check off against layout
  - e. On new jobs prepare machine for set-up man by changing collets, feeders, cams and stocking up machine
  - f. Cross check parts made by other operators
  - g. Assist lead man in operation and maintenance of more difficult jobs
  - h. Under supervision begin to service and make adjustments on such attachments as thread rollers, thread cutting die heads, threading clutches, rotary slotters, cross-drilling and cross-tapping attachments.

**E. Fifth Phase – At Machine** **1,000**

1. Basic Trouble Shoot and Set-up
  - a. Continue prior instruction and practice
  - b. Learn to trouble shoot work spindles and burring spindles; determine causes of runout; remove old and install new chuck levers and extensions; change inner spindle; eliminate and play
  - c. Under direction begin to service and adjust attachments such as fly-cutters, straddle milling, end milling, index milling, revolving drill spindles
  - d. Service cross-slides and tool arms
  - e. Align and adjust rear end burring attachment
  - f. Begin to question methods, layouts, speeds and feeds
  - g. Begin to set-up simple type of jobs

**F. Sixth Phase – At Machine** **1,000**

1. Intermediate Set-up
  - a. Continue prior instruction and practice
  - b. Operate and maintain all but the most complicated jobs
  - c. Begin to help and instruct trainees of lesser experience
  - d. Carry through on new job set-ups from start to finish on all but the most complicated jobs
  - e. Increase proficiency in trouble-shooting mechanical and tooling problems
  - f. Understand, adjust and maintain thread clutch

**G. Seventh Phase – At Machine** **1,000**

1. Advanced Set-up and Operation
  - a. Continue prior instruction and practice
  - b. Operate and maintain any type of job with any type of attachment
  - c. Act as lead man with trainee
  - d. Analyze speeds and feeds
  - e. Select alternate cams if needed
  - f. Make tool and layout changes as conditions may require for greater job efficiency
  - g. Make all minor machine repairs as needed, assist in major repairs

**H. Eighth Phase – At Machine** **1,000**

1. Final Proficiency Development
  - a. Continue prior instruction and practice
  - b. Set-up any job
  - c. Trouble shoot and get running any job
  - d. Continue to increase proficiency in all areas
  - e. Advise Engineering Department on tool design, methods, and job layout
  - f. Act as group leader

**Approximate Total hours** **8,000**

*Apprenticeship work processes are applicable only to training curricula for apprentices in approved programs. Apprenticeship work processes have no impact on classification determinations under Article 8 or 9 of the Labor Law. For guidance regarding classification for purposes of Article 8 or 9 of the Labor Law, please refer to <https://dol.ny.gov/public-work-and-prevailing-wage>.*

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## **APPENDIX B**

### **RELATED INSTRUCTION**

#### **Safety**

1. Fundamentals
2. Personal Safety
3. Fire Protection
4. Shop Safety
5. Material Safety
6. Safe Trade Practice
7. First Aid (10 hours per year)
8. Sexual Harassment Prevention Training – must comply with section 201-g of the Labor Law

#### **Industrial and Labor Relations**

1. History and Background
2. Types of Organization
3. Economics
4. Social Security
5. Workmen's Compensation
6. Current Laws and Practices

#### **Blueprint Reading, Drawing, and Sketching**

1. Fundamentals of Blueprint Reading and Sketching
2. Elementary Machine Blueprint Reading and Sketching
3. Advanced Blueprint Reading and Sketching
4. Machine and Die Design
5. Tool, Jig and Fixture Design

#### **Mathematics**

1. Fundamentals
2. Elementary Applications to the Trade
3. Advanced Applications to the Trade

4. Precision Measurement
5. Using Handbooks, Tables, Calculators, etc.
6. Estimating
7. Metrics

### **Trade Theory**

1. Tools, Machines and Equipment
2. Care, Maintenance and Operation
3. Terminology
4. Materials of the Industry
5. Technology of Jobs, Occupations and Processes
6. Layout and Production Methods

### **Trade Science**

1. Mechanics as Applied to the Trade
2. Principles of Electricity as Applied to the Trade
3. Coolants and Lubricants
4. Cutting Tools
5. Abrasives
6. Tool, Die, Jig and Fixture Design
7. Heat treatments
8. Metallurgy as Applied to the Trade
9. Welding

### **Other Related Courses as Needed**

144 Hours of Related Instruction is Required for Each Apprentice for Each Year through Four Years, 576 Hours total.

Appendix B topics are approved by New York State Education Department.