

INSTRUMENT TECHNICIAN

APPENDIX A

O*NET CODE 17-3023.01

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

	Approximate Hours
A. Care and Use of Tools and Equipment	1000
1. Tools	
a. Screw Drivers, Wrenches, Hammers, Chisels, Back Saw, Files, Electric Hand Drill, Air Hammer, Cartridge Gun, Prods, Pliers	
2. Test Equipment	
a. Watt Meters, Volt Meters, Ohm Meters, Amp Meters, Oscilloscopes, Tube Testers, Audio Oscillators, KW. HR. Meters, Calibration Tanks	
3. Machinery	
a. Bench Grinder, Drill Press, Buffer, Welder (Thermocouples)	
B. Safety Precautions and Devices	500
1. Mechanical Equipment	
2. Hand Tools	
3. Electrical	
a. Tag and lock out procedures	
b. Use of protective equipment	
c. Use of voltage tester	
C. Instrument Installation and Repairer	5000
1. Types of Instruments or Equipment	
a. Recording	
i. Temperature	
ii. Controllers	
iii. Atmosphere	

- b. Testing
 - i. Sonic
 - ii. Thickness Gauges
- c. Control
 - i. Timers
 - ii. Temperatures
 - iii. Valve Control Motors
- d. Output
 - i. Amplifiers
 - ii. High Frequency Generators
- e. Miscellaneous
 - iii. Thermocouples
 - iv. Potentionmeters
 - v. Thermometers
- 2. Installation Procedures
 - a. Planning
 - i. Check specifications, blueprints, diagrams, drawings or instructions for the job
 - ii. Determine what equipment, material, etc., is necessary for the job
 - iii. Prepare requisitions accordingly
 - b. Preparation for Installation
 - i. Determine from blueprints the location of installation
 - ii. Make a safety check
 - iii. Prepare layout
 - iv. Check availability of utilities needed, etc.
 - v. Calibrate and adjust equipment
 - c. Installation
 - i. Install fasteners
 - ii. Set equipment
 - iii. Wire or connect, adjust in accordance with instructions or driections
 - iv. Check and test operation
- 3. Repair of Instruments
 - a. Check instrument to determine source of trouble

- i. Check circuiting
 - ii. Test tubes, condensers, resistors, etc.
 - iii. Check mechanical parts.
- b. Remove defective parts, wiring, etc., and replace or repair
- c. Calibrate or otherwise adjust equipment
- d. Check operations
 - i. test output, etc.
- 4. Maintenance of Instruments
 - a. Cleaning and lubrication
 - b. Checking standard cells
 - c. Installation of charts, changing charts, etc.
 - d. Inking pens, cams, etc.
 - e. Checking humistats
- 5. Checking Testing and Troubleshooting Procedures
 - a. Check power input
 - b. Check tube
 - c. Check condenser and transformer
 - d. Check wiring
 - e. Check resistor valve

D. Electrician Repair and Maintenance

1500

- 1. Types of Electrical Equipment
 - a. Fractional H.P. Motors
 - b. Motor driven valves
 - c. Motor driven switches
 - d. Solenoids
 - e. Transformers
 - f. Relays
 - g. Condensers
 - h. Coils
 - i. Contacts
 - j. Timers
 - k. Switches other than motor driven
- 2. Method and Procedure for Repairs and Maintenance

- a. Motor Driven Equipment
 - i. Disassemble equipment
 - ii. Remove motor
 - iii. Disassemble motor
 - iv. Check armature, windings and gashes
 - v. Check bearings, remove, clean, replace
- b. Other Electrical Equipment
 - i. Remove, check, test
 - ii. Disassemble
 - iii. Repair or replace
 - iv. Adjust
 - v. Reassemble
- 3. Construction, Maintenance or Repair of Power Transmission Lines
 - a. Care and Use of Tools and Equipment
 - i. Pipe cutters
 - ii. Wrenches
 - iii. Ladders
 - iv. Scaffolding
 - v. Channel locks
 - vi. Pipe dies
 - vii. Pipe benders
 - viii. Ratchet chain pulls
 - b. Types of Lines
 - i. Conduit
 - ii. Duct
 - iii. Open
 - c. Methods and Procedures for Construction of Power Transmission Lines
 - i. Locate power transmission lines in accordance with prints or plans
 - ii. Fastening, cutting and bending of conduit
 - iii. Fastening and cutting of duct
 - iv. Fastening and installation of open wiring
 - v. Pulling wires through conduit or duct

- d. Methods and Procedures for Construction of Other Electrical Equipment
 - i. Determine from prints or plans location for installation of electrical equipment.
 - ii. Prepare bases of facilities for fastening
 - iii. Install equipment
 - iv. Connect power transmission lines
- e. Safety Precaution

Approximate Total Hours 8000

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

Blueprint Reading, Sketching and Drawing

1. Fundamentals
2. Mechanical Blueprint Reading and Sketching
3. Electrical Blueprint Reading and Sketching

Mathematics

1. Fundamentals
2. Precision Measurement
3. Applications to the Trade

Safety

1. Fundamentals (4 hours, 1st year)
2. Trade Safety (12 hours, 2nd year)
3. Sexual Harassment Prevention Training – must comply with section 201-g of the Labor Law
4. First Aid (6.5 hours every 3 years)

Industrial and Labor Relations (20 hours)

1. History and Background (6 hours, 1st year)
2. Current Laws and Practices (14 hours, 2nd year)

Trade Theory and Practice

1. Tools, Machines and Equipment
2. Operation, Care and Maintenance
3. Materials
4. Terminology
5. Theory of Jobs and Processes

Trade Science

1. History of Instrument Making
2. Technology of Jobs and Processes
3. Physical Properties of Materials
4. Principles of Tool Making Practice
5. Principles of Instrument Repair and Maintenance

6. Heat Treatment of Metals
7. Metallurgy

Other Related Courses as Necessary

144 hours of Related Instruction are required for each Apprentice for each year
Appendix B topics are approved by New York State Education Department.