

Received: L&I Tukwila
March 10, 2022

Received: L&I Tukwila
March 7, 2022

Department of Labor & Industries
Apprenticeship Section
PO Box 44530
Olympia WA 98504-4530



REQUEST FOR REVISION OF STANDARDS

Sandra K. Husband
L&I apprenticeship coordinator

TO: Washington State Apprenticeship & Training Council

From: Northwest Machinists Apprenticeship Committee, #95
(NAME OF PROGRAM STANDARDS)

Teri Gardner 3-14-22

Teri Gardner 3-7-22

Please update our Standards of Apprenticeship to reflect the following changes.
Additions shall be underlined.
Deletions shall be ~~struck through~~.
See attached.

Authorized signatures

(chr.) <i>Tom [Signature]</i>	Approved by: Washington State Apprenticeship & Training Council
(sec.)	Secretary of WSATC:
date: <i>3/7/22</i>	date:

attach additional sheets if necessary

Northwest Machinists Apprenticeship Committee, #95

Cover Page

<u>Occupational Objective(s):</u>	<u>SOC#</u>	<u>Term [WAC 296-05-015]</u>
AUTOMOTIVE BODY AND FENDER	49-3021.00	8000 HOURS
AUTOMOTIVE MACHINIST (AUTOMOTIVE REPAIR SHOPS)	49-3023.01	8000 HOURS
MACHINIST AUTOMOTIVE (MACHINE SHOPS)	51-4041.00	8000 HOURS
<u>INDUSTRIAL MACHINERY TECHNICIAN</u>	<u>49-9041.00</u>	<u>8000 HOURS</u>

IV. Term of Apprenticeship:

[Please delete and replace the term of apprenticeship chart.]

<u>Heavy Duty Equipment Mechanic</u>	<u>4 years (8000 hours) of employment</u>
<u>Industrial Machinery Technician</u>	<u>4 years (8000 hours) of employment</u>
<u>Machinist</u>	<u>4 years (8000 hours) of employment</u>
<u>Trailer, Container and Van Repair Mechanic</u>	<u>4 years (8000 hours) of employment</u>

VIII. Work Processes:

[Please delete schedules A., B., & C. in their entirety. Please list existing occupations D., E. & F., and the new occupation in alphabetical order starting with A.]

<u>D. Industrial Machinery Technician</u>	<u>Approximate Hours</u>
<u>1. Carrying out duties pertaining to: General shop operations, safety, tool and equipment maintenance, material handling and inventory control.....</u>	<u>600</u>
<u>2. Operate Engine/Motor/Pump Repair Monitors, troubleshoots, installs, and repairs systems.....</u>	<u>2000</u>
<u>3. Read and interpret Work Orders/Job Plans, Regulations, Work Documentation, and shop math.....</u>	<u>400</u>
<u>4. Maintenance: Performs planned and unscheduled machine/motor/Pump maintenance Procedures.....</u>	<u>2000</u>
<u>5. Safety Documentation & Customer Support, Catalog research, organizing of tools and materials, daily reporting & customer relations.....</u>	<u>300</u>
<u>6. Operation and Care of tools and equipment.....</u>	<u>400</u>

Northwest Machinists Apprenticeship Committee, #95

7. Rigging and Forklift Operation, Use of Gantry Overhead Crane System, forklift, chain fall and pulley systems.....300

8. Monitor, Troubleshoot, install, set up and repair machinery and systems, areas of specialty include Power Gen, Marine and Pump Station2000

TOTAL HOURS: 8000

IX. Related/Supplemental Instruction:

B. (See Below) Minimum RSI hours per year defined per the following [see WAC 296-05-015(6)]:

1. ~~Automotive Body & Fender, Automotive Machinist (Automotive Repair Shops), Heavy Duty Equipment Mechanic, Machinist Automotive (Machine Shops),~~ Industrial Machinery Technician, and Trailer, Container and Van Repair Mechanic: minimum of 144 hours per year.

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Received: L&I Tukwila
 March 3, 2022

Teri Gardner 3-7-22

Journey Level Wage Rate
 From which apprentices' wages rates are computed

TO: Washington State Apprenticeship & Training Council

From Northwest Machinists Apprenticeship Committee

(NAME OF STANDARDS)

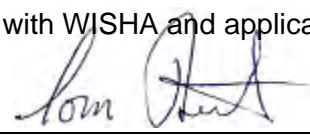
Occupations	County(s)	Journey Level Wage Rate	Effective Date:
Industrial Machinery Technician	<p>The state of Washington (with the exception of apprentices registered to the occupation of Heavy Duty Mechanic that are employees of the City of Seattle),</p> <p>Oregon counties of Clatsop, Columbia, Washington, Multnomah, Clackamas and,</p> <p>Idaho counties of Bonner, Kootenai, Benewah, Latah and Nez Perce.</p>	\$25.00/hour	4/21/22

Apprenticeship Related/Supplemental Instruction (RSI) Plan Review

Program Sponsor Northwest Machinists Apprenticeship Committee		<i>Teri Gardner 3-14-22</i>
Skilled Occupational Objective Industrial Machinery Technician		<i>Teri Gardner 3-7-22</i>
Term/OJT Hours 8000	Total RSI Hours	
	576	
Training Provider Machinists Institute		

By the signature placed below, the **program sponsor** agrees to provide the prescribed RSI for each registered apprenticeship and assures that:

- The RSI content and delivery method is and remains reasonably consistent with the latest occupational practices, improvements, and technical advances.
- The RSI is coordinated with the on-the-job work experience.
- The RSI is provided in safe and healthful work practices in compliance with WISHA and applicable federal and state regulations.



Thomas Hunt

Printed Name of Program Sponsor

Signature of Program Sponsor

By the signature placed below, the **training provider** assures that:

- The RSI will be conducted by instructors who meet the qualifications of "competent instructor" as described in WAC 296-05-003.
 - Has demonstrated a satisfactory employment performance in his/her occupation for a minimum of three years beyond the customary learning period for that occupation; and
 - Meets the State Board for Community and Technical Colleges requirements for a professional technical instructor (see WAC 131-16-080 through -094), or be a subject matter expert, which is an individual, such as a journey worker, who is recognized within the industry as having expertise in a specific occupation; and
 - Has training in teaching techniques and adult learning styles, which may occur before or within one year after the apprenticeship instructor has started to provide the related technical instruction.
- If using alternative forms of instruction, such as correspondence, electronic media, or other self-study, such instruction is clearly defined.



Shana Peschek

Print Name Training Provider

Signature of Training Provider

Executive Director

Title of Training Provider

Machinists Institute

Organization of Training Provider

If there are additional training providers, please provide information and signatures on the next page.

Additional Resources: [Apprenticeship Related Supplemental Instruction \(RSI\) Plan Review Glossary of Term \(F100-519-000\)](#) and [Apprenticeship Related Supplemental Instruction \(RSI\) Plan Review Criteria \(F100-521-000\)](#).

SBCTC Program Administrator has reviewed RSI plan and recommendations of the Trade Committee.

Click or tap here to enter text.

Print Name of SBCTC Program Administrator

Signature of SBCTC Program Administrator

Date

SBCTC recommends approval

SBCTC recommends return to sponsor

Additional Training Providers (if necessary)

Print Name Training Provider

Signature of Training Provider

Title of Training Provider

Organization of Training Provider

[Click or tap here to enter text.](#)

Print Name Training Provider

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Title of Training Provider

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Organization of Training Provider

Program Sponsor: Northwest Machinists Apprenticeship Committee	Skilled Occupational Objective: Industrial Machinery Technician
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Note: The description of each element must be in sufficient detail to provide adequate information for review by the SBCTC and Review Committee. To add more elements, click on the plus sign that appears below the "Description of element/course" field.

Describe minimum hours of study per year in terms of (check one):

- 12-month period from date of registration.
- Defined 12-month school year.
- 2,000 hours of on-the-job training.

Year 1 (144 hours)

Element/Course: Quarter -1 Industrial Machinery Technician Fundamentals	Planned Hours: 58
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute	
<p>Description of quarter: This is a preparatory course for the industrial machinery technician program. Coursework includes shop safety and tool basics for Industrial Machinery Technicians (IMTs). The course explores power generator training options available in the power generation sectors. Instruction will include a mix of classroom, virtual and lab with a small self-study component. Topics that are covered include safety for the IMT and the basic tools needed and used by IMT to perform quality work skills of the industry.</p> <p>Courses include:</p> <ul style="list-style-type: none"> • Safety for Industrial Machinery Technicians • Tool Basics for Industrial Machinery Technicians <p>The above courses are described in detail as follows with the 58 hours of RSI broken down:</p>	

Q1/Course 1: Safety for Industrial Machinery Technicians	Planned Hours: 38
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute	
<p>Description of course: This is a preparatory course for the Industrial Machinery Technician (IMT) apprenticeship program. Coursework includes shop safety; workplace documentation; and an introduction to power generator machinery as applied to real-world maintenance and repair. At the completion of this course, students will be able to define Occupational Safety and Health Administration (OSHA); distinguish between employees covered by OSHA; describe the various hazards covered by OSHA standards and compliance programs; describe the involvement of employees in OSHA onsite inspections; describe employer and employee responsibilities for workplace safety standards; recordkeeping and reporting requirements for employers; and elaborate on the effect that OSHA has on workplace accidents. Students will identify methods of blocking; the basic requirements of an energy control program; OSHA's typical minimal lockout procedure; the steps in the lockout sequence for a typical minimal lockout procedure and the sequence of steps for restoring equipment to service after lockout.</p> <p>Students will describe the ways hazard communication exists and is enforced and identify chemical hazard classifications, types of physical and health hazards with systemic effects. They will describe the labeling requirements necessary for a hazardous communication program. In addition, students will learn the general guidelines for hand and power tool safety and how to identify characteristics of a well-organized work including proper tool maintenance, materials handling, Personal Protective Equipment (PPE), ergonomics, and the safety risks of tasks that require repetition, force, or vibration. Students will describe arc flash and common causes of arc flash; the dangers associated with arc flash; the different pieces of PPE employees most commonly use to protect against arc flash; different safeguarding devices used to prevent arc flash; the steps for establishing Electrically Safe Work Conditions (ESWC); and the arc flash safety responsibilities of employers and employees.</p> <p>Students will describe the importance of safety when performing maintenance duties; how lockout/tagout keeps employees safe during maintenance; and how safety blocking prevents movement of machine components. Students will identify common hazards during metal cutting; the importance of personal responsibility when operating machine tools; safe lifting practices; common fire hazards for cutting operations; basic procedures necessary before operating a machine tool safely; common point-of-operation hazards and safety hazards associated with cutting fluids; methods to minimize operator contact with chips; safety hazards on the manual lathe and mill; machine guarding methods for CNC machines and the characteristics of a well-organized worksite. Students will identify machine motion hazards and other hazardous activity; basic safeguarding standards and devices; maintenance safeguarding; and machine safeguard training.</p> <p>Topics include: Intro to OSHA 101, Powered Industrial Truck Safety 221, Lockout/Tagout Procedures 141, SDS/Hazardous Communication 151, Hand and Power Tool Safety 201, Arc Flash Safety 251, Stamping Safety 115, Safety for Mechanical Work 111, Safety for Electrical Work 111, Press Brake Safety 100, Rigging Inspection & Safety 210, and Machine Guarding 271</p>	

Q1/Course 2: Tool Basics for Industrial Machinery Technicians	Planned Hours: 20
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute	

Description of course: This is a preparatory course that introduces common industrial machinery technician (IMT) tools and the various roles of testing instruments in maintaining safety on the job. Students will gain a better understanding of the operating conditions of working around and machinery to describe and demonstrate how to use tools safely and accurately.

Because tool costs are a significant component of overall maintenance expenditures, students will learn how to recognize, lessen, and possibly prevent tool wear, how IMTs can prolong tool life, reduce tool cost, and improve productivity. Students will be able to identify common types of tool wear and strategies to reduce or prevent them from occurring.

Topics include: Optimizing Tool Life and Processes 381 and Electrical Instruments 251

Element/Course: Quarter - 2 Industrial Machinery Fundamentals II	Planned Hours: 44
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Mode of Instruction (check all that apply)

Classroom Lab Online Self-Study

Provided by: Machinists Institute

Description of quarter: This is a preparatory course for the industrial machinery technician program. Coursework includes basic employability skills, communication skills, and introduction to trade math. The course explores power generator training options available in the power generation sectors. Instruction will include a mix of classroom, virtual and lab.

Courses include:

- **Basic Employability Skills**
- **Basic Communication Skills**
- **Engine Mechanical Basics**
- **Introduction to Trade Math**

The above courses are described in detail as follows with the 44 hours of RSI broken down:

Q2/Course 1: Basic Employability Skills	Planned Hours: 8
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Mode of Instruction (check all that apply)

Classroom Lab Online Self-Study

Provided by: Machinists Institute

Description of course: This course will immerse students in the acceptable employee standards including the importance of timeliness, conflict resolution, ability to take direction, task completion, appropriate communication styles, personal appearance, ethics, honesty, integrity, and reliability.

In addition to learning about the internal attributes to employability, students will learn to describe the manufacturing workforce and distinguish between common pathways to manufacturing careers. They will be able to describe common functions of development and design, production, programming, quality control (QC), quality assurance (QA), maintenance, health and safety, and coordination roles. Students will also be able to distinguish between different departments involved with business functions.

Topics include: Careers in Manufacturing 102

Q2/Course 1: Basic Communication Skills	Planned Hours: 8
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Mode of Instruction (check all that apply)

Classroom Lab Online Self-Study

Provided by: Machinists Institute

Description of course: This introductory course teaches techniques for effective communication in the workplace and includes lessons that emphasize the importance of verbal, written and reading skills in the trades. Students will be able to define the role of effective communication, list common forms of written business communication; explain the steps in business writing, how to effectively use business email; list the steps for an effective presentation including how use of various visual aids, plan a meeting, and the execution of a meeting.

At the completion of this course, students will demonstrate the importance of creativity in the workplace, how individuals and teams can develop their creativity, and how organizations can promote innovation. Students will define the role of knowledge in the workplace.

Topics include: Personal Effectiveness 190, Department of Transportation Hazardous Communication Overview 153

Q2/Course 1:	Engine Mechanics Basics	Planned Hours:	18
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute			
<p>Description of course: This is a preparatory course that provides a foundational overview of mechanical systems. Simple machines are the building blocks of even the most complex mechanical systems because they manipulate mechanical forces including distance and friction, to achieve mechanical advantage. Understanding how simple machines work is essential to understanding and working with any type of machinery. Students will be familiarized with each type of simple machine, their components, functions, and mechanical advantages, as the basis for understanding advanced mechanical topics.</p> <p>Students will be able to describe mechanical systems and factors affecting mechanical advantage. They will describe the three classes of levers; wheels and axles; fixed and movable pulleys; and differences in mechanical advantage between movable pulley systems. They will identify inclined planes; wedges; screws; and distinct types of gears. Students will also distinguish between other devices used in mechanical systems and describe gravity and friction effects on machines. They will be able to contrast equilibrium and dynamic forces; distinguish between linear and rotary motions; between linear and rotary speeds and velocity.</p> <p>At the completion of the course, students will evaluate power, manual, and automatic transmissions, and will be able to identify common mechanical faults that occur in motor drive systems and their symptoms. They will discuss, compare, and contrast the importance of reactive and corrective maintenance and how they differ from preventive maintenance. Students will list the significance of planned downtime on maintenance and discuss factors involved in selecting a maintenance approach.</p> <p>Topics include: Intro to Mechanical Systems 101, Forces on Machines 121, Power Transmission Components 201, Mechanical Power Variables 201, Mechanical Maintenance for Motor Drive Systems 349, Approaches to Maintenance 131</p>			

Q2/Course 3:	Introduction to Trade Math	Planned Hours:	10
Mode of Instruction (check all that apply) <input checked="" type="checkbox"/> Classroom <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute			
<p>Description of course: In this introductory math course, students will develop basic and foundational math skills that are useful for calculations and problem solving in manufacturing and industrial maintenance settings. Topics will include fractions, decimals, metric conversions, tolerances, and an introduction to basic geometry, angular measure, and dimensional analysis. Using mathematics as a form of industry-based communication is emphasized.</p> <p>Students will define geometry, points, lines, and rays; parts of, and different types of angles and angle pairs; finding perpendicularity, parallelism, planes; and variables. Students will also define interior angles of triangles; properties of lines and adjacent and vertical angles; and the identification of the different types of triangles by their sides and by their angles.</p> <p>Students will be able to solve the missing measurements in singular or multiple right triangles and describe the basic properties of circles and semicircles including contrasting radius and diameters, circumference, area, and the angles of a circle. They will solve for missing angles in a bolt circle problem; tangents; and polygons; emphasize the characteristics of a right triangle using the Pythagorean theorem; common trigonometric ratios; SOHCAHTOA; and solving for missing dimensions using less common trigonometric ratios</p> <p>Topics include: Math Fundamentals 101, Math: Fractions and Decimals 111, Units of Measurement 112, Algebra Fundamentals 141, Geometry</p>			

Element/Course:	Quarter - 3 Introduction to Systems	Planned Hours:	42
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute			
<p>Description of quarter: This is a preparatory course for the industrial machinery technician program. Coursework includes engine mechanical basics, fluid, and cooling systems. The course explores power generator training options available in the power generation sectors. Instruction will include a mix of classroom, virtual and lab.</p>			

Courses include:

- Fluid Systems
- Cooling Systems

The above courses are described in detail as follows with the 42 hours of RSI broken down:

Q3/Course 2:	Fluid Systems	Planned Hours: 21
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute		
<p>Description of course: The Fuel Systems course provides a comprehensive overview of pneumatics, fittings, control valves, and filtration systems, as well as an overview of the maintenance processes required for these operations. The unique types of fittings have a profound impact on the effectiveness of pneumatic and fuel systems. The course will develop successful preventive maintenance programs to help industrial facilities reduce downtime, lessen the need for costly repairs, and increase productivity. Students will gain an understanding of the benefits of a well-designed preventive maintenance program for fluid systems.</p> <p>In this class, students will be able to identify fittings used in pneumatic systems; proper fittings selections that provide optimal efficiency; and identification of fluid conductors and specific advantages and disadvantages within fluid systems. They will demonstrate an understanding of how different pneumatic valves affect the flow of pressurized air in a system; how to evaluate and select components that control pressurized flow in pneumatic systems; and understand the functions of hydraulic control valves, and their proper placement within hydraulic circuits to produce usable power. Students will understand the main types of hydraulic control valves and their various functions and identify schematic symbols for common control valves.</p> <p>At the completion of this course, students will define pressure and flow ratings, identify types of leakage and common issues that lead to failure in fluid systems. Adequate fluid levels and associated preventive maintenance tasks are critical to industrial maintenance. Students will describe the purpose of seals for fluid systems and demonstrate seal installation and maintenance; they will distinguish between pressure-compensated and temperature-compensated flow control valves; identify the types of pneumatic valves; describe the fluid system contaminants; how an ISO 4406:1999 rating indicates a fluid's cleanliness and discuss how filter condition indicator monitor filter performance; elaborate on preventive maintenance for fluid and filters; and system flushing methods.</p> <p>Topics include: Intro to Fluid Conductors 241, Fittings for Fluid Systems 251, Preventative Maintenance for Fluid Systems 261, Hydraulic Control Valves 341, Pneumatic Control Valves 351, Contamination and Filter Selection 381</p>		

Q3/Course 3:	Cooling Systems	Planned Hours: 21
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute		
<p>Description of course: The cooling systems course provides a comprehensive overview of essential components of cooling systems including water pumps, thermostats, cooling fans, radiators, hoses and coolants.</p> <p>Students will learn how waste energy from diesel engines is dissipated, hybrid power systems of diesel and Rankine cycles, energy utilization through optimized efficiency, and energy balancing. Students will be introduced to the First and Second laws of thermodynamics, diesel engine efficiency and emissions models, turbines, reciprocating engines, and the different types of working fluids.</p> <p>Topics include: Laws of Thermodynamics, Turbines, Pumps, Waste Energy, Heat Transfer, and Working Fluids</p>		

Year 2 (144 hours)

Element/Course:	Quarter - 4 Electrical and Diesel Fundamentals	Planned Hours: 71
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute		
<p>Description of quarter: This is an intermediate course for the Industrial Machinery Technician program. Coursework includes electrical and diesel mechanical basics. Instructions will include a mix of classroom, virtual and labs.</p>		

Courses include:

- **Electrical Fundamentals**
- **Diesel Mechanical Basics**

The above courses are described in detail as follows with the 71 hours of RSI broken down:

Q4/Course 1:	Electrical Fundamentals	Planned Hours: 47
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute		
<p>Description of quarter: This is an intermediate course in electrical requirements for industrial maintenance technicians. Electrical fundamentals, such as introduction to electrical units; voltage and current calculations using Ohm's Law; AC/DC; use of voltmeters, ohm meters, ammeters and multimeters; electrical components including resistors, coils, capacitors and diodes, will be covered.</p> <p>At the completion of the course, students will describe electricity using coulombs, amperage, voltage, how resistance defines Ohm's Law, wattage, direct, and alternating current; and will demonstrate the importance of balancing tool life and production rates, circuits, purpose of common protective devices, grounding, and overcurrent devices. They will demonstrate the fundamentals of electricity; develop proficiency with the vocabulary used; build an understanding of advanced electrical concepts; and discuss electrical industrial maintenance requirements using correct terminology.</p> <p>Topics include: Electrical Units 101, Introduction to Circuits 201, and Electrical Instruments 251</p>		

Q4/Course 2:	Diesel Mechanical Basics	Planned Hours: 24
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute		
<p>Description of course: This is an introductory course to diesel systems including the diesel engine, diesel engine support systems, and the exhaust system. The class includes an overview of the diesel cycle, and a short history of the diesel engine and covers the changeable aspects of mechanical power. Basic power variables include speed, power, torque, horsepower, and mechanical forces. All machines rely on rotary motion, linear motion, or a combination of the two to perform work, and different power variables relate to each type of motion. Effectively converting one form of motion to another requires a clear understanding of the functional and mathematical relationship between the two forms.</p> <p>Industrial maintenance technicians often determine which power components are most suitable for specific operations, evaluate machine efficiency, and determine when machine components should be replaced. Familiarity with power variables and their effects can help to prevent machine downtime and component failure. After taking this class, users will understand the basic variables involved in power transmission so that they can use mechanical power properly, safely, and efficiently.</p> <p>Topics include: Mechanical Power Variables 202</p>		

Element/Course:	Quarter - 5 Lubrication Systems	Planned Hours: 23
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute		
<p>Description of quarter: This is an intermediate course for the industrial machinery technician program. Students will learn about the different types of lubricants used in industrial equipment. Coursework includes scavenging processes and lubrication systems. Instructions will include a mix of classroom, virtual and labs.</p> <p>Courses include:</p> <ul style="list-style-type: none"> • Lubrication Systems <p>The above courses are described in detail as follows with the 23 hours of RSI broken down:</p>		

Q5/Course 1:	Lubrication Systems	Planned Hours: 23
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study		

Provided by: Machinists Institute	
<p>Description of course: This intermediate course covers lubrication and lubricating oils, oil pumps, filters, oil coolers and pressure sensors and describes different types of lubricants and appropriate uses for them in machines and mechanical systems. A variety of machines require proper lubrication to function safely and efficiently. Lubricants help prevent wear and ensure operational efficiency by decreasing friction between components in contact. Common industrial lubricants include oil, grease, and solid lubricants.</p> <p>Industrial maintenance technicians must understand basic lubricant properties to select, apply, and replace lubricants properly. Students also learn to recognize signs of improper lubrication and be aware of proper maintenance, storage, and safety practices for lubricants. After completing this course, students will gain an understanding of the advantages and disadvantages of using different types of lubricants, operational properties, and maintenance procedures for proper lubrication.</p>	
Topics include: Lubricant Fundamentals 211	

Element/Course: Quarter - 6 Welding, Regulations, & Troubleshooting	Planned Hours: 50
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study	
Provided by: Machinists Institute	
<p>Description of quarter: This is an intermediate course for the industrial machinery technician program. Coursework includes Welding I and either an introduction to regulations or course in troubleshooting. The instructor will include a mix of classroom, virtual and F2F labs.</p> <p>Courses include:</p> <ul style="list-style-type: none"> • Welding (all) • Introduction to Regulations or • Troubleshooting <p>The above courses are described in detail as follows with the 50 hours of RSI broken down:</p>	

Q6/Course 1: Welding	Planned Hours: 30
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study	
Provided by: Machinists Institute	
<p>Description of course: Welding I course provides foundational knowledge necessary for the educational development of welding professionals. This knowledge will serve as the basis on which more comprehensive and process-specific knowledge is built and introduces students to common welding processes and workpiece materials as well as joint and welding types. This includes discussions surrounding joint preparation, discontinuities, welding procedure specifications, and testing and inspection methods for welding.</p> <p>In this course, students will demonstrate how trade math is used in welding; describe weldable materials; structural shapes commonly joined using welding processes; identify common joint and weld types; how joints are prepared for welding; weld discontinuities, defects, and procedure specifications; testing and inspection methods. They will identify and use gages, calipers, and micrometers; steel rules, go/no-go gages, combination squares and protractors. Students will describe safety essentials, safety data sheets (SDS), and welding PPE; how insulation and PPE can help prevent electric shock; dangers of fume plumes; how to prevent fume inhalation and ensure safety in confined spaces; and list OSHA training requirements for welding. Students will learn about electricity and explain how to reduce exposure to electromagnetic fields, and the negative consequences of electrically generated heat. They will describe basic electrical safety precautions, best practices for working with welding circuits, the work and electrode cables. Students will demonstrate grounding in arc welding, electrically hazardous conditions, and processes recommended for these conditions. They will identify insulation and PPE for electrical safety, equipment ratings, and their capacity; and describe maintenance and inspection for electrical safety.</p> <p>By the completion of this course, students will describe arc welding processes such as shielded, gas, metal arc, flux-cored, and gas tungsten arc welding. They will also describe oxyfuel and other common and emerging welding processes. Students will identify essential welding variables; workpiece materials suitable for different welding processes; nonessential welding variables; welding procedure specifications; and sections of welding procedure specifications.</p>	

Topics include: Welding Safety Essentials 101, PPE for Welding 111, Welding Fumes and Gases Safety 121, Electrical Safety for Welding 131, Introduction to Welding 141, Introduction to Welding Processes 151, Math Fundamentals for Welding 161

Q6/Course 2: Introduction to Regulations	Planned Hours: 20
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute	
Description of course: This course will focus on the training requirements for regulations that govern power generator maintenance at federal, state, and local governments.	
At the completion of this course, students will be able to demonstrate compliance-based maintenance standards and best practices and will be introduced to terminology and definitions specific to regulations compliance. They will use and apply industry specific documents to replicate industry scenarios such as hospitals, commercial, and residential buildings etc. to align with industry certifications such as EGSA.	
Topics include: WA State and Local Regulations	

Q6/Course 2: Troubleshooting and Diagnostics	Planned Hours: 20
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute	
Description of course: The Troubleshooting and Diagnostics course provides a comprehensive overview of various methods and tools used to troubleshoot problems.	
In this course, students will apply tools and techniques to find the root cause of problems, and will distinguish deviations from problems, including identifying early warning signs of equipment failure. They will use check sheets, fishbone diagrams, and Pareto charts as troubleshooting tools, and the 5 Whys, brainstorming, and troubleshooting teams as common methods of gathering troubleshooting data.	
At the completion of this course, students will be able to solve problems and understand how to work on preventing in many different settings. Without this knowledge, students would not be able to solve problems effectively. The instructor will contextualize projects in lab for students in specialized areas of focus.	
Topics include: Troubleshooting 181	

Year 3 (144 hours)

Element/Course: Quarter - 7 Rigging and Communication	Planned Hours: 50
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute	
Description of quarter: This is an intermediate course for the industrial machinery technician program. Courses in this quarter focus on rigging, communication, and documentation. It is important that IMT's are knowledgeable and familiar with rigging practices and that they are effective communicators written and oratory, and that they can fulfil the workplace requirements for proper and accurate documentation. Instructions will include a mix of classroom, virtual and labs.	
Courses include:	
<ul style="list-style-type: none"> • Rigging • Communication and Documentation 	
The above courses are described in detail as follows with the 50 hours of RSI broken down:	

Q7/Course 1: Rigging	Planned Hours: 20
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Online <input type="checkbox"/> Self-Study	

Provided by: Machinists Institute

Description of course: This course covers OSHA regulations, the use and inspection of slings, rigging hardware, load weight and other areas critical to understanding and operating a safe job site, and is recommended for all employees who are working within the fall zone of a load and especially if they are involved in the hooking and unhooking of the load or in the guiding of a load.

Per OSHA standards, before employees are exposed to fall hazards, employers must first provide rigging training. This course is recommended for all individuals working at heights as it points out potential hazards and issues involved with fall protection, the need to protect workers, and the knowledge required to solve fall hazard problems.

In this course, students will become proficient in sling inspections and hitches. They will be able to verify the load weight, rating charts, sling angles, center of gravity, fall zones, tag lines, and power line safety. Students will demonstrate safe working practices around cranes and will become familiar with OSHA and ASME regulations. They will evaluate, inspect, and use proper chain slings; wire rope slings; round slings; web slings; and mesh slings. At the completion of this course, students will describe proper sling protection, what shackles, eyebolts, hooks, mechanical couplers, swivel hoist rings, and plate clamps are, as well as proper rigging hardware for onsite rigging, overhead gantry cranes, chain falls, and boom trucks. Upon completion of this course the students will have met the OSHA 1910.30 and ANSI requirements.

Topics include: OSHA Rigging Standards, ASME Rigging Standards, Fall Precautions PPE, and Rigging

Q7/Course 2: Communication and Documentation

Planned Hours: 30

Mode of Instruction (check all that apply)

Classroom Lab Online Self-Study

Provided by: Machinists Institute

Description of course: This course covers OSHA regulations, the use and inspection of slings, rigging hardware, load weight and other areas critical to understanding and operating a safe job site, and is recommended for all employees who are working within the fall zones of loads, especially if they are involved in hooking and unhooking loads or in guiding loads. Worksite communication skills ensure the working environment poses minimal to no risk for workers, and that work tasks are completed correctly, and quality is maintained. Students will apply effective communication using spoken and written communication to create and give presentations using cultural and emotional intelligence.

Students will gain tips and strategies required for relationship building, conflict resolution, and teamwork fundamentals. Students will define the role of effective communication; describe common forms of written business communication; explain the steps in business writing, how to effectively use business email, and the steps for an effective presentation. They will define the use of various visual aids and explain how to plan a meeting. Students will be able to describe the execution of a meeting and explain the importance of creativity in the workplace. They will define the role of knowledge in the workplace.

At the completion of this course, students will be able to demonstrate how to perform proper documentation, manual reading, and cataloging skills required for technical trades; how to use proper terminology for areas of focus including naval/vessel; pump station/power generation; and customer relations. Students will be able to clearly explain how work processes are to be performed to site inspectors and/or customers using written and oral reports.

Topics include: Communication for Trades, SDS and Hazard Communication 151, and Personal Effectiveness 190

Element/Course: Quarter - 8 Systems

Planned Hours: 58

Mode of Instruction (check all that apply)

Classroom Lab Online Self-Study

Provided by: Machinists Institute

Description of quarter: This is an intermediate course for the industrial machinery technician program. Coursework includes basic electronics, marine engine/propulsion/fluids, pump theory/systems/value systems, and power generator testing/engaging/switching gears. The course explores intermediate industrial maintenance training options available in multiple industrial maintenance sectors. Instructions will include a mix of classroom, virtual and labs.

Courses include:

- **Basic Electronics / All Systems (All Take)**
- **Marine Engines / Propulsion / Fluids or**
- **Pump Theory and Systems / Value Systems or**

- **Power Generator Testing / Engaging / Switch Gears**

The above courses are described in detail as follows with the 58 hours of RSI broken down:

Q8/Course 1: Quarter - 8 Electronics / All Systems	Planned Hours: 38
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute	
<p>Description of course: This class introduces students to electrical prints and symbols that are most used in maintenance to prepare them for reading and writing their own electrical prints. These are integral skills for working with electrical systems, since almost all electrical projects, from designing a circuit to troubleshooting, and fixing faulty electrical equipment, involve electrical prints. Students will understand and practice precautionary and preventative measures to safely and effectively work with electricity.</p> <p>In this course, students will be able to describe the elements that make up wiring schematics, identify types and applications of electrical and wiring repair procedures, schematic diagram electrical symbols. They will demonstrate how to read writing schematics and give recommendations for diagnostic strategies using electrical schematics and test equipment. Students will describe various uses of electrical schematics and identify differences between various types of electrical schematics, power, and ground distribution. They will distinguish between other common types of electrical prints and how they assist with electrical troubleshooting.</p> <p>Students will discuss the importance of following electrical safety standards and practices, they will list organizations and texts that govern electrical safety. They will evaluate and apply the three-stage safety model while describing the basic principles of electricity. Students will identify the components of circuits and describe common PPE devices. After completing this course, they will be able to describe the best practices for maintaining safety and preventing injury while working with electrical systems.</p> <p>Topics include: Electrical Print Reading 261, Safety for Electrical Work 111, and Introduction to Circuits 201</p>	

Q8/Course 2: Marine Engines/Propulsion/Fluid Systems	Planned Hours: 20
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute	
<p>Description of course: The Marine Engines / Propulsion / Fluid Systems course is built on the electronics course whereby students will be able to troubleshoot and repair marine systems using theoretical knowledge and practical applications. They will demonstrate different types and arrangements of ship machinery applied for ship propulsion and understand the main parameters of ship machinery. Students will demonstrate an understanding of basic propulsion power transmission principles and knowing the conceptual requirements for reliable and safe work of ship propulsion.</p> <p>By the end of this course, students will be able to identify the main components of maritime diesel engines and understand their functions. Students will familiarize themselves with common problems involving diesel engine parts and demonstrate an understanding of the basic requirements for reliable and safe operations of diesel engines.</p> <p>Topics include: Marine Engines, Propulsion, and Fluid Systems</p>	

Q8/Course 2: Pump Theory and Systems/Value Systems	Planned Hours: 20
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute	
<p>Description of course: The Pump Theory and Systems/Value Systems course provides an overview of the major pumping-related components found in value systems. This course covers typical applications of various types of pumps and details of how to trouble shoot pumping systems. Students will demonstrate an understanding of pumping systems, seal components, types, filters of systems, the role of a pump station and how to properly trouble shoot pump systems. Students will also gain knowledge in identifying potential solutions for improvement pump system capacity, increasing asset life, and thus decreasing costs.</p> <p>By the end of this course, students will have a solid understanding of pump systems and value systems, components and appropriate system components.</p> <p>Topics include: Pump Theory, Pump Systems, Value Systems, Troubleshooting, Pump Efficiency</p>	

Q8/Course 2: Power Generator Systems and Controls	Planned Hours: 20
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute	
Description of course: The Power Generator Systems and Controls course focuses on equipment and controls, and engine maintenance of electrical generators and power generation systems that run in a variety of commercial and personal applications.	
Students in this course will understand and apply principles of electricity to evaluate and work on AC/DC electrical systems, power, and control electronics. They will work on motor and alternator controls and rotating electrical machines. They will evaluate load bank testing and demonstrate preventative maintenance required for power generator equipment and control systems.	
Topics include: Power Generators, Systems, Controls, and Preventative Maintenance	

Element/Course: Quarter - 9 Industrial Machinery Technician Intermediate Lab	Planned Hours: 36
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute	
Description of quarter: In this final quarter of YR3 program pathways, students on marine/maritime, power generator, and pump station maintenance pathways will participate in intermediate lab activities that summate previously learned skills whereby course instructors will provide hands-on activities using pathways-specific equipment in lab settings to demonstrate specific tasks and/or processes and observes knowledge, skills, and abilities from graduating apprentices.	
Courses include: <ul style="list-style-type: none"> • Industrial machinery technology intermediate lab The above courses are described in detail as follows with the 36 hours of RSI broken down:	

Q9/Course 1: Industrial Machinery Technician Intermediate Lab	Planned Hours: 36
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute	
Description of course: The course introduces students to intermediate labs of systems and elements building on YR2 through a series of hands-on projects. Students learn materials, methods, tools, data collection, reduction and analysis, and presentation of results.	
The instructor will provide hands-on activities using real world power generator, marine and pump station equipment to demonstrate and evaluate apprentice knowledge of systems and practices specific to the power gen technician pathway. Elements in the course include quality assurance in lab projects, work documentation practices, introduction to associated rules, and local and/or federal regulations.	
Topics include: Diesel Power Generators, Electronics, Quality Assurance, Testing Parameters, Hydraulics, Electronics, Quality Assurance, and Propulsion, Workplace Documentation, Pump Systems, Metallurgy, and Value Systems	

Year 4 (144 hours)

Element/Course: Quarter – 10 Forklift and Hazwoper	Planned Hours: 65
Mode of Instruction (check all that apply) <input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study Provided by: Machinists Institute	
Description of quarter: This intermediate quarter emphasizes the safe operation of materials handling equipment; certification for forklift safety; and Hazwoper. Students will be able to safely operate forklifts as well as be prepared for Hazwoper 40 certification.	

Courses include:

- **Forklift / Scissor lift Training & Certification**
- **Hazwoper 40**

The above courses are described in detail as follows with the 65 hours of RSI broken down:

Q10/Course 1:	Forklift/Scissor Lift Training & Certification	Planned Hours:	25
Mode of Instruction (check all that apply)			
<input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study			
Provided by: Machinists Institute			
<p>Description of course: This is a course that teaches students how to safely operate fork and scissor lifts. Students will be able to recognize the differences between the forklift and the automobile and explain the different types of forklifts. They will identify the hazards involved with forklifts and identify forklift controls and instrumentation. Students will understand vehicle refueling and recharging of batteries and visibility concerns -including restrictions due to loading. They will be able to identify lift capacity and explain how to maintain vehicle stability within vehicle limitations. Students will perform vehicle inspections to identify potential safety concerns, describe the impact of surface conditions and load composition. They will understand load manipulation, stacking, and unstacking.</p> <p>At the completion of this course, students will interpret operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate and demonstrate proficient operator skills on a forklift.</p> <p>Topics include: OSHA Compliant Forklift/Scissor Lift Training, Certification Testing</p>			

Q10/Course 2:	HAZWOPER	Planned Hours:	40
Mode of Instruction (check all that apply)			
<input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study			
Provided by: Machinists Institute			
<p>Description of course: The course covers: implementation of the employer's emergency response plan, classification and identification of unknown materials using field survey instruments, functioning within the Incident Command System, selection and use of specialized chemical protective equipment, hazard and risk assessment techniques, performing advanced product control operations, implementation of decontamination procedures, understanding proper termination procedures, and understanding basic chemical and toxicological terminology.</p> <p>This course meets the requirements of OSHA 29 CFR 1910.120(q) for hazardous materials technician training and consists of 5 modules containing 23 lessons and a final exam. Students will be introduced to agencies and regulations, fall hazards, electrocution, confined spaces, excavations, and fall protection. They will become familiar with tools, fire prevention, and many types of workplace hazards. They will revisit ergonomics, decontamination, site safety planning, and how to deal with site emergencies.</p> <p>Topics include: OSHA Hazwoper 40</p>			

Element/Course:	Quarter –11 Leadership & Advanced Regulations	Planned Hours:	44
Mode of Instruction (check all that apply)			
<input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study			
Provided by: Machinists Institute			
<p>Description of quarter: This advanced course prepares apprentices for workplace leadership and provides training and knowledge of state and federal regulations. Students will be prepared for leadership opportunities, a vital component of career advancement. Power gen students will become well versed with regulations pertaining to their chosen technician pathways. Other students will gain experience in manual machining.</p> <p>Courses include:</p> <ul style="list-style-type: none"> • Leadership (All take) • Advanced Regulations or • Introduction to Machining <p>The above courses are described in detail as follows with the 46 hours of RSI broken down:</p>			

Q11/Course1:	Leadership	Planned Hours:	28
Mode of Instruction (check all that apply)			
<input type="checkbox"/> Classroom <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Online <input type="checkbox"/> Self-Study			

Provided by: Machinists Institute

Description of course: The Leadership course provides scaffolding for foundations learned in communication to extend students' knowledge and skills for leadership, including communication skills to support mentorship/knowledge transfer from journey to apprentice, conflict resolution, effective team leadership and effective communication skills. Students will apply fundamentals of the human relations and communication processes to personal and workplace relationships documentation and customer service. Emphasis will be placed on applying communication theory to interviewing, small group communications, and public speaking. Students will be required to prepare and give oral presentations, based on instructor-determined assignments and/or projects.

The course includes respectful workplace training such as 'RISE Up' to address anti-harassment training requirements and emphasize the tools and skills necessary to create and maintain a safe, inclusive and productive workplace environment. Other topics include the issues surrounding diversity in the modern workplace as well as employer responsibilities regarding diversity management; how to identify and prevent harassment and discrimination in a diverse workplace; and the basic Federal employment laws that apply to manufacturing. Students will identify the basic responsibilities of a team leader and give helpful ideas about how to gain the respect and trust of others; key types of communication; and common roadblocks to communication. They will use effective communication as a tool to help build teamwork, manage conflict, and motivate team members. Students will address employee performance issues dealing with a variety of situations in which a conflict may occur and demonstrate constructive advice for the best approaches to dealing with those conflicts.

Instructor-led projects designed to extend knowledge, skills, and abilities in leadership, communication and promotion of respectful workplace principles will be used. Assignments will focus on how students demonstrate competency in focus areas and the promotion of independent learning. Course activities will build on previous courses and topics covered and may involve projects that require students to work in teams.

Topics include: Leadership Fundamentals, Mentorship Matters, and Rise Up

Q11/Course 2: Advanced Regulations for Power Generator

Planned Hours: 16

Mode of Instruction (check all that apply)

Classroom Lab Online Self-Study

Provided by: Machinists Institute

Description of course: In this course, students will become immersed in understanding and evaluating regulations pertaining to their chosen technician pathway. Students will use applied policy and practice specific Code of Federal Regulations, CMS, NFPA 110, State, and City Building Codes. At the completion of the course, students will know how to apply and use confidence testing.

Topics include: Applied Policies, Recycling & Disposal, WA State & City Building Codes

Q11/Course 2: Introduction to Machining

Planned Hours: 16

Mode of Instruction (check all that apply)

Classroom Lab Online Self-Study

Provided by: Machinists Institute

Description of course: This is an introductory machine shop class using conventional lathes and mills in a manufacturing facility. Skills taught and practiced include inside diameter (ID) and outside diameter (OD) turning, knurling, parting off on engine lathes; and drilling, boring; face, end, slot, and contour milling on milling stations. Milling and turning calculations for speeds and feeds are covered.

At completion of this course, students will safely setup and operate manual mills and lathes; describe basic functions and operations of manual mills and engine lathes; identify machine components of the vertical column and knee mill, common cutting operations performed on the mill, and various cutting tools and toolholders used on the mill; identify machine components for engine lathes, including cutting tools and toolholders used on the engine lathe. Students will describe work holding devices used on mill and lathes; and how to calculate cutting speeds, feed rates, and depths of cuts. Students will demonstrate and perform milling operations such as drilling, facing, end and contour milling; and turning operations such as boring and parting off operations per drawing and machining industry standards; external and internal turning to specifications per drawings; internal and external threading to specifications per drawings; and knurling to specifications per drawing and machining industry standards.

Topics include: Manual Mill Basics 201, Engine Lathe Basics 211, Manual Mill Setup 221, Engine Lathe Setup 231, Manual Mill Operation 251, Engine Lathe Operation 261, and Threading on the Engine Lathe 301

Element/Course: Quarter –12 Industrial Machinery Technician Advanced Lab	Planned Hours: 35
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Mode of Instruction (check all that apply)

Classroom Lab Online Self-Study

Provided by: Machinists Institute

Description of quarter: In this final quarter of the apprenticeship program pathways, students on marine/maritime, power generator, and pump station maintenance pathways will participate in advanced lab activities that summate previously learned skills whereby course instructors will provide hands-on activities using pathways-specific equipment in lab settings to demonstrate specific tasks and/or processes and observes knowledge, skills, and abilities from graduating apprentices.

Courses include:

- Industrial machinery technician advanced lab

The above courses are described in detail as follows with the 35 hours of RSI broken down:

Q12 Course 1: Industrial Machinery Technician Advanced Lab	Planned Hours: 35
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Mode of Instruction (check all that apply)

Classroom Lab Online Self-Study

Provided by: Machinists Institute

Description of course: The Industrial Machinery Technician Advanced course immerses students in advanced level of systems and elements building on YR3 through a series of hands-on projects. Students learn materials, methods, tools, data collection, reduction, analysis, and presentation of results.

The course instructor will provide hands-on exercises to demonstrate knowledge of systems and practices relevant to marine, power gen and pump station technician focus. Elements will include quality assurance in lab projects, work documentation practices and associated rules and regulations. The instructor will provide hands-on activities using equipment and machinery and materials in a lab setting to demonstrate knowledge of systems and practices. Elements in this course will include quality assurance in lab projects, work documentation practices and associated rules and regulations, equipment testing, maintenance, audits and emergency generator switch gear.

Topics include: Hydraulics, Electronics, Quality Assurance, Propulsion, Diesel Power Generation, Electronics, Quality Assurance, and Testing Procedures, Workplace Documentation, Pump Systems, Metallurgy, Manufacturing Process Applications: Part I 124, and Value Systems