

**K TO 12 BASIC EDUCATION CURRICULUM**  
**JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD TRACK AND SENIOR HIGH SCHOOL – TECHNICAL-VOCATIONAL LIVELIHOOD TRACK**  
**INDUSTRIAL ARTS - TRANSMISSION LINE INSTALLATION AND MAINTENANCE NC II**  
(640 Hours)

These are the specializations and their pre-requisites. These lists should be used as reference for curriculum maps.

**AGRI-FISHERY ARTS**

	<b>Specialization</b>	<b>Number of Hours</b>	<b>Pre-requisite</b>
1.	Agricultural Crops Production (NC I)	320 hours	
2.	Agricultural Crops Production (NC II) <i>updated based on TESDA Training Regulations published December 28, 2013</i>	640 hours	
3.	Agricultural Crops Production (NC III)	640 hours	Agricultural Crops Production (NC II)
4.	Animal Health Care Management (NC III)	320 hours	Animal Production (Poultry-Chicken) (NC II) or Animal Production (Ruminants) (NC II) or Animal Production (Swine) (NC II)
5.	Animal Production (Poultry-Chicken) (NC II) <i>updated based on TESDA Training Regulations published December 28, 2013</i>	320 hours	
6.	Animal Production (Large Ruminants) (NC II) <i>updated based on TESDA Training Regulations published December 28, 2013</i>	320 hours	
7.	Animal Production (Swine) (NC II) <i>updated based on TESDA Training Regulations published December 28, 2013</i>	320 hours	
8.	Aquaculture (NC II)	640 hours	
9.	Artificial Insemination (Large Ruminants) (NC II)	160 hours	Animal Production (Large Ruminants) (NC II)
10.	Artificial Insemination (Swine) (NC II)	160 hours	Animal Production (Swine) (NC II)
11.	Fish Capture (NC II)	640 hours	
12.	Fishing Gear Repair and Maintenance (NC III)	320 hours	
13.	Fish-Products Packaging (NC II)	320 hours	
14.	Fish Wharf Operation (NC I)	160 hours	
15.	Food Processing (NC II)	640 hours	
16.	Horticulture (NC III)	640 hours	Agricultural Crops Production (NC II)
17.	Landscape Installation and Maintenance (NC II)	320 hours	
18.	Organic Agriculture (NC II)	320 hours	
19.	Pest Management (NC II)	320 hours	
20.	Rice Machinery Operations (NC II)	320 hours	
21.	Rubber Processing (NC II)	320 hours	
22.	Rubber Production (NC II)	320 hours	
23.	Slaughtering Operations (Hog/Swine/Pig) (NC II)	160 hours	

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**HOME ECONOMICS**

	<b>Specialization</b>	<b>Number of Hours</b>	<b>Pre-requisite</b>
1.	Attractions and Theme Parks Operations with Ecotourism (NC II)	160 hours	
2.	Barbering (NC II)	320 hours	
3.	Bartending (NC II)	320 hours	
4.	Beauty/Nail Care (NC II)	160 hours	
5.	Bread and Pastry Production (NC II)	160 hours	
6.	Caregiving (NC II)	640 hours	
7.	Commercial Cooking (NC III)	320 hours	Cookery (NC II)
8.	Cookery (NC II)	320 hours	
9.	Dressmaking (NC II)	320 hours	
10.	Events Management Services (NC III)	320 hours	
11.	Fashion Design (Apparel) (NC III)	640 hours	Dressmaking (NC II) or Tailoring (NC II)
12.	Food and Beverage Services (NC II) <i>updated based on TESDA Training Regulations published December 28, 2013</i>	160 hours	
13.	Front Office Services (NC II)	160 hours	
14.	Hairdressing (NC II)	320 hours	
15.	Hairdressing (NC III)	640 hours	Hairdressing (NC II)
16.	Handicraft (Basketry, Macrame) (Non-NC)	160 hours	
17.	Handicraft (Fashion Accessories, Paper Craft) (Non-NC)	160 hours	
18.	Handicraft (Needlecraft) (Non-NC)	160 hours	
19.	Handicraft (Woodcraft, Leathercraft) (Non-NC)	160 hours	
20.	Housekeeping (NC II) <i>updated based on TESDA Training Regulations published December 28, 2013</i>	160 hours	
21.	Local Guiding Services (NC II)	160 hours	
22.	Tailoring (NC II)	320 hours	
23.	Tourism Promotion Services (NC II)	160 hours	
24.	Travel Services (NC II)	160 hours	
25.	Wellness Massage (NC II)	160 hours	

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**INDUSTRIAL ARTS**

	<b>Specialization</b>	<b>Number of Hours</b>	<b>Pre-requisite</b>
1.	Automotive Servicing (NC I) <i>updated based on TESDA Training Regulations published December 28, 2013</i>	640 hours	
2.	Automotive Servicing (NC II)	640 hours	Automotive Servicing (NC I)
3.	Carpentry (NC II)	640 hours	
4.	Carpentry (NC III)	320 hours	Carpentry (NC II)
5.	Construction Painting (NC II)	160 hours	
6.	Domestic Refrigeration and Air-conditioning (DOMRAC) Servicing (NC II)	640 hours	
7.	Driving (NC II)	160 hours	
8.	Electrical Installation and Maintenance (NC II)	640 hours	
9.	Electric Power Distribution Line Construction (NC II)	320 hours	Electrical Installation and Maintenance (NC II)
10.	Electronic Products Assembly and Servicing (NC II) <i>updated based on TESDA Training Regulations published December 28, 2013</i>	640 hours	
11.	Furniture Making (Finishing) (NC II)	640 hours	
12.	Instrumentation and Control Servicing (NC II)	320 hours	Electronic Products Assembly and Servicing (EPAS) (NC II)
13.	Gas Metal Arc Welding (GMAW) (NC II)	320 hours	Shielded Metal Arc Welding (SMAW) (NC II)
14.	Gas Tungsten Arc Welding (GTAW) (NC II)	320 hours	Shielded Metal Arc Welding (GMAW) (NC II)
15.	Machining (NC I)	640 hours	
16.	Machining (NC II)	640 hours	Machining (NC I)
17.	Masonry (NC II)	320 hours	
18.	Mechatronics Servicing (NC II)	320 hours	Electronic Products Assembly and Servicing (EPAS) (NC II)
19.	Motorcycle/Small Engine Servicing (NC II)	320 hours	
20.	Plumbing (NC I)	320 hours	
21.	Plumbing (NC II)	320 hours	Plumbing (NC I)
22.	Refrigeration and Air-Conditioning (Packaged Air-Conditioning Unit [PACU]/Commercial Refrigeration Equipment [CRE]) Servicing (NC III)	640 hours	Domestic Refrigeration and Air-conditioning (DOMRAC) Servicing (NC II)
23.	Shielded Metal Arc Welding (NC I)	320 hours	
24.	Shielded Metal Arc Welding (NC II)	320 hours	Shielded Metal Arc Welding (NC I)
25.	Tile Setting (NC II)	320 hours	
26.	Transmission Line Installation and Maintenance (NC II)	640 hours	Electrical Installation and Maintenance (NC II)

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**INFORMATION, COMMUNICATIONS AND TECHNOLOGY (ICT)**

	<b>Specialization</b>	<b>Number of Hours</b>	<b>Pre-requisite</b>
1.	Animation (NC II)	320 hours	
2.	Broadband Installation (Fixed Wireless Systems) (NC II)	160 hours	Computer Systems Servicing (NC II)
3.	Computer Programming (.Net Technology) (NC III) <i>updated based on TESDA Training Regulations published December 28, 2013</i>	320 hours	
4.	Computer Programming (Java) (NC III) <i>updated based on TESDA Training Regulations published December 28, 2013</i>	320 hours	
5.	Computer Programming (Oracle Database) (NC III) <i>updated based on TESDA Training Regulations published December 28, 2013</i>	320 hours	
6.	Computer Systems Servicing (NC II) <i>updated based on TESDA Training Regulations published December 28, 2007</i>	640 hours	
7.	Contact Center Services (NC II)	320 hours	
8.	Illustration (NC II)	320 hours	
9.	Medical Transcription (NC II)	320 hours	
10.	Technical Drafting (NC II)	320 hours	
11.	Telecom OSP and Subscriber Line Installation (Copper Cable/POTS and DSL) (NC II)	320 hours	Computer Systems Servicing (NC II)
12.	Telecom OSP Installation (Fiber Optic Cable) (NC II)	160 hours	Computer Systems Servicing (NC II)

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Prerequisite: Electrical Installation and Maintenance NC II

**Course Description:**

This curriculum guide on Transmission Line Installation and Maintenance NC II is designed to develop and enhance the knowledge, skills and attitudes of a transmission line lineman in accordance with industry standards. It covers the core competencies, such as 1) erecting pole, 2) performing overhead transmission line work, 3) performing cold-live-and ground maintenance work, 4) installing emergency restoration structure (ERS), and 5) operating and maintaining transmission line tools and equipment.

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<p><b>Introduction</b></p> <ol style="list-style-type: none"> <li>Basic concepts in Transmission Line Installation and Maintenance</li> <li>Relevance of the course</li> <li>Career opportunities</li> </ol>	The learner demonstrates an understanding of basic concepts and theories in Transmission Line Installation and Maintenance.	The learner independently demonstrates common competencies in Transmission Line Installation and Maintenance as prescribed in the TESDA Training Regulation.	<ol style="list-style-type: none"> <li>Explain the basic concepts in Transmission Line Installation and Maintenance.</li> <li>Discuss the relevance of the course.</li> <li>Explore career opportunities for Transmission Line Installation and Maintenance.</li> </ol>	
<b>PERSONAL ENTREPRENEURIAL COMPETENCIES AND SKILLS (PECS)</b>				
<ol style="list-style-type: none"> <li>Assessment of Personal Entrepreneurial Competencies and Skills (PECS) vis-à-vis a practicing entrepreneur /employee                             <ol style="list-style-type: none"> <li>Characteristics</li> <li>Attributes</li> <li>Lifestyle</li> <li>Skills</li> <li>Traits</li> </ol> </li> <li>Analysis of PECS in relation to a practitioner.</li> </ol>	The learner demonstrates an understanding of one's PECS	The learner recognizes his/her PECS and prepares an activity plan that aligns with that of a Transmission Line Installation and Maintenance practitioner/ entrepreneur.	<p><b>LO 1. Recognize PECS needed in Household Services.</b></p> <ol style="list-style-type: none"> <li>Assess one's PECS: characteristics, attributes, lifestyle, skills, and traits.</li> <li>Assess practitioner's PECS: characteristics, attributes, lifestyle, skills, and traits.</li> <li>Compare one's PECS with those of a practitioner /entrepreneur.</li> <li>Align one's PECS with those of a practitioner/entrepreneur.</li> </ol>	<b>TLE_PECS9-12-00-1</b>
<b>ENVIRONMENT AND MARKET (EM)</b>				
<ol style="list-style-type: none"> <li>Key concepts of Environment and Market</li> <li>Products and services available in the market</li> <li>Differentiation of products and services</li> </ol>	The learner demonstrates an understanding of environment and market in relation to a career choice in Transmission	The learner independently generates a business idea based on the analysis of environment and market in Transmission Line Installation and Maintenance.	<p><b>LO 1. Generate a business idea that relates with a career choice in Transmission Line Installation and Maintenance.</b></p> <ol style="list-style-type: none"> <li>Conduct SWOT analysis.</li> </ol>	<b>TLE_EM9-12-00-1</b>

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4. Customers and their buying habits 5. Competition in the market 6. SWOT analysis	Line Installation and Maintenance.		1.2 Identify the different products/services available in the market. 1.3 Compare different products/services in computer hardware servicing business. 1.4 Profile potential customers. 1.5 Profile potential competitors. 1.6 Generate potential business idea based on the SWOT analysis.	
<b>CORE COMPETENCIES</b>				
<b>LESSON 1: PERFORMING TRANSMISSION LINE POLE ERECTION (PTPE)</b>				
<ul style="list-style-type: none"> <li>• Work procedures</li> <li>• Interpretation of working drawings</li> <li>• Rigging equipment</li> <li>• Lineman’s occupational safety and health standards</li> <li>• Transmission line tools, equipment and hardware</li> <li>• Different pole erection methods</li> <li>• Working in a team environment with desirable work values and attitudes</li> <li>• Pole hauling, pole setting and pole erection</li> <li>• Working in a team environment</li> <li>• Power industry SOP on preparing tools and equipment</li> <li>• Listing of tools, materials and equipment</li> </ul>	The learner demonstrates understanding of the concepts and theories in erecting transmission line pole installing new pole and/or replacing old or damaged poles based on TESDA training regulation.	The learner independently demonstrates erecting a transmission line pole and/or installing new pole replacing old or damaged poles based on TESDA training regulation.	<b>LO 1. Plan and prepare work.</b> 1.1 Secure work instruction according to policies and procedures. 1.2 Interpret work instruction to determine job requirements. 1.3 Identify relevant occupational health and safety requirements following job specifications. 1.4 Identify and request relevant transmission line tools equipment and hardware in accordance with job specifications.	<b>TLE_IATLIM9-12PTPE-Ia-e-1</b>
<ul style="list-style-type: none"> <li>• Lineman’s occupational health and safety standards, procedures, practices and regulations</li> <li>• Checking of transmission line tools, equipment and hardware</li> <li>• Personal Protective Equipment (PPE)</li> </ul>			<b>LO 2. Prepare transmission line tools, equipment and hardware.</b> 2.1 Identify Personal Protective Equipment (PPE) in line with job requirements. 2.2 Identify and acquire transmission line tools, equipment and hardware in line with job requirement. 2.3 Check/Inspect transmission line tools, equipment and hardware.	<b>TLE_IATLIM9-12PTPE-If-h-2</b>

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> <li>• Pole loading methods</li> <li>• Preparation of tools equipment for pole transport</li> <li>• Pole loading procedures</li> <li>• Pole hauling procedures</li> <li>• Emergency-related drills and training</li> <li>• Hand signal communication</li> <li>• PPE</li> <li>• Unloading procedure and technique</li> </ul>			<b>LO 3. Transport pole to job site.</b> 3.1 Perform loading procedures for poles in line with safety requirement. 3.2 Perform hauling and dragging poles following established procedures. 3.3 Perform unloading of transmission pole.	<b>TLE_IATLIM9-12PTPE-If-j-3</b>
<ul style="list-style-type: none"> <li>• Types of poles</li> <li>• Pole setting tools, materials and equipment are prepared.</li> <li>• Pole setting procedure</li> <li>• Pole grounding procedure</li> <li>• Pole excavation procedure</li> </ul>			<b>LO 4. Perform pole-setting and excavation.</b> 4.1 Perform pole setting procedure in line with job requirements. 4.2 Install pole grounding, if necessary. 4.3 Perform excavation procedure following established safety requirements.	<b>TLE_IATLIM9-12PTPE-IIa-c-4</b>
<ul style="list-style-type: none"> <li>• Poles erection tools materials and equipment</li> <li>• Pole erection procedure</li> <li>• Pole retiring procedure</li> <li>• Housekeeping procedure</li> </ul>			<b>LO 5. Erect and/or retire pole.</b> 5.1 Perform pole erection procedure in line with job requirements. 5.2 Perform pole retiring procedure in line with job requirements. 5.3 Perform housekeeping following power industry procedure.	<b>TLE_IATLIM9-12PTPE-IIc-j-5</b>
<b>LESSON 2: PERFORMING OVERHEAD TRANSMISSION LINE WORK (POTW)</b>				
<b>The Utility Sector</b> <ul style="list-style-type: none"> <li>• Work instruction</li> <li>• Overhead transmission line tools, equipment and hardware</li> <li>• Working efficiently and systematically</li> <li>• First aid skills</li> <li>• Electrical drawings and symbols</li> <li>• Tools, materials and equipment identification</li> </ul>	The learner independently demonstrates an understanding of the concepts and principles in performing over-head transmission line work, installing and replacing existing transmission line which is 69 KV and above based on TESDA training regulation		<b>LO 1. Plan and prepare for work.</b> 1.1 Interpret and secure work instruction according to job requirements. 1.2 Identify and request relevant transmission line tools, equipment and hardware in accordance with job specifications. 1.3 Analyze and apply first aid skills in line with the accident happened.	<b>TLE_IATLIM9-12POTW-IIIIa-e-6</b>

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<ul style="list-style-type: none"> <li>• Electrical drawings and symbols</li> <li>• Procedure to secure tools, equipment and materials</li> <li>• Inspection procedures of transmission line tools and equipment</li> </ul>			<p><b>LO 2. Prepare transmission tools, equipment and hardware.</b></p> <p>2.1 Interpret, understand and read technical documents like electrical drawings and symbols.</p> <p>2.2 Acquire and secure transmission line tools, equipment and hardware in line with job requirements.</p> <p>2.3 Check transmission tools, equipment and hardware.</p>	<p><b>TLE_IATLIM9-12POTW-IIIIf-j-7</b></p>
<ul style="list-style-type: none"> <li>• Work procedure and instruction.</li> <li>• High voltage isolation procedures and live-line tester</li> <li>• Conductor riding technique</li> <li>• Constructing of overhead transmission lines structures</li> <li>• Housekeeping</li> </ul>			<p><b>LO 3. Perform overhead line construction work.</b></p> <p>3.1 Secure confirmation to proceed to work from appropriate personnel for safety in accordance with power industry procedure.</p> <p>3.2 Perform overhead line construction work procedures according to job specifications.</p> <p>3.3 Perform housekeeping procedure in line with policies and safety guidelines.</p>	<p><b>TLE_IATLIM9-12POTW-IV-8</b></p>
<b>LESSON 3: PERFORMING COLD LINE MAINTENANCE WORK (PCMW)</b>				
<ul style="list-style-type: none"> <li>• Transmission line tools and equipment and PPE</li> <li>• Line hardware, materials and design structures and specifications</li> <li>• Cold-line maintenance procedure</li> </ul>	<p>The student demonstrates understanding of the concepts and principles in live-line maintenance on any existing transmission line hardware and materials using both hot sticks and bare hand methods based on TESDA training regulations</p>	<p>The student independently demonstrates cold line maintenance on any existing transmission line hardware and materials using both hot sticks and bare hand methods based on TESDA training regulations</p>	<p><b>LO 1. Prepare hardware, tools and equipment.</b></p> <p>2.1 Identify and acquire transmission line tools, equipment and hardware in line with job requirements.</p> <p>2.2 Check/Inspect hardware tools, and equipment based on specifications.</p>	<p><b>TLE_IATLIM9-12PCMW-Ia-e-9</b></p>



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<ul style="list-style-type: none"> <li>• Cold-line maintenance procedure</li> <li>• Scheduled maintenance</li> <li>• Preventive maintenance</li> <li>• Emergency maintenance</li> <li>• Corrective maintenance</li> </ul>			<p><b>LO 2. Perform cold-line maintenance procedure.</b></p> <p>3.1 Secure confirmation to proceed to work from appropriate personnel in accordance with power industry procedure.</p> <p>3.2 Perform cold-line maintenance work procedure following job requirements.</p>	<p><b>TLE_IATLIM9-12PCMw-If-j-II-10</b></p>
<b>LESSON 4: PERFORMING GROUND LINE MAINTENANCE WORK (PGMW)</b>				
<ul style="list-style-type: none"> <li>• Ground line hardware, materials and design structures specifications</li> <li>• Maintenance procedure</li> </ul>	<p>The student demonstrates understanding of the concepts and principles in live-line maintenance on any existing transmission line hardware and materials using both hot sticks and bare hand methods based on TESDA training regulations</p>	<p>The student independently demonstrates cold line maintenance on any existing transmission line hardware and materials using both hot sticks and bare hand methods based on TESDA training regulations</p>	<p><b>LO 1. Plan and prepare for work.</b></p> <p>1.1 Interpret work instruction to determine job requirements.</p> <p>1.2 Identify and request relevant transmission line tools, equipment and hardware in accordance with job specifications.</p>	<p><b>TLE_IATLIM9-12PGMW-III-a-c-11</b></p>
<ul style="list-style-type: none"> <li>• Ground-line tools, equipment and hot line trailer</li> <li>• Work procedure</li> <li>• Checking of tools, equipment and materials.</li> </ul>			<p><b>LO 2. Prepare transmission line tools, equipment and hardware.</b></p> <p>2.1 Identify Personal Protective Equipment (PPE) in line with job requirements.</p> <p>2.2 Acquire transmission line tools, equipment and hardware in line with job requirement.</p> <p>2.3 Check/Inspect transmission line tools, equipment and hardware based on specifications.</p>	<p><b>TLE_IATLIM9-12PGMW-IIIc-e-12</b></p>
<ul style="list-style-type: none"> <li>• Ground-line maintenance work procedures</li> <li>• Ground line hardware, materials design structures and specifications</li> </ul>			<p><b>LO 3. Perform ground – line maintenance procedure.</b></p> <p>3.1 Perform ground-line maintenance work procedure following job requirements.</p> <p>3.2 Perform housekeeping based on industry requirements.</p>	<p><b>TLE_IATLIM9-12PGMW-III-f-j-13</b></p>

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<b>LESSON 5: INSTALLING EMERGENCY RESTORATION STRUCTURE (IMRS)</b>				
<ul style="list-style-type: none"> <li>• Emergency restoration design structures and specifications</li> <li>• Work procedure</li> <li>• Types of emergency</li> </ul>	The student demonstrates an understanding of the Knowledge, skills and attitude involving working in a team environment in Installing Emergency Restoration Structures (ERS) based on TESDA training regulations.	The student independently demonstrates the knowledge skills and attitude involving working in a team environment in Installing Emergency Restoration Structures (ERS) based on TESDA training regulations.	<b>LO 1. Plan and prepare for work.</b> 1.1 Interpret work instruction to determine job requirements. 1.2 Identify and request relevant transmission line tools, equipment and hardware in accordance with job specifications.	<b>TLE_IATLIM9-12IMRS-IVa-c-14</b>
<ul style="list-style-type: none"> <li>• Emergency restoration structures tools, equipment and hardware and specifications</li> <li>• PPE</li> <li>• Checking of tools equipment and materials</li> </ul>			<b>LO 2. Prepare hardware, tools and equipment.</b> 2.1 Identify and obtain Personal Protective Equipment (PPE) in line with job requirements. 2.2 Acquire transmission line tools, equipment and hardware in line with job requirements. 2.3 Check/Inspect emergency restoration structures, tools, equipment and hardware based on specifications.	<b>TLE_IATLIM9-12IMRS-IVc-e-15</b>
<ul style="list-style-type: none"> <li>• Types of emergency</li> <li>• Work procedure</li> <li>• Erection procedure of emergency restoration structures.</li> <li>• Stringing procedure in emergency restoration structures</li> </ul>			<b>LO 3. Erect emergency restoration structure.</b> 3.1 Perform Emergency Restoration Structure (ERS) erection procedure in line with job requirements. 3.2 Perform stringing procedure in line with job requirements. 3.3 Perform housekeeping procedure in line with power industry procedure.	<b>TLE_IATLIM9-12IMRS-IVf-j-16</b>
<b>LESSON 6: PERFORMING LIVE - LINE MAINTENANCE WORK (PLMW)</b>				
<ul style="list-style-type: none"> <li>• Safety procedure and safety standard</li> <li>• Live line maintenance tools and equipment</li> <li>• Live-line electrical design</li> </ul>	The student demonstrates an understanding of the concepts and principles in live -line maintenance on any existing transmission line hardware and	The student independently demonstrates live- line maintenance on any existing transmission line hardware and materials using both hot sticks and bare hand methods based	<b>LO 1. Plan and prepare for work.</b> 1.1 Interpret work instruction to determine job requirements 1.2 Identify and request relevant transmission line tools, equipment and hardware in accordance with job specifications	<b>TLE_IATLIM9-12PLMW-I-17</b>

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
structures. <ul style="list-style-type: none"> <li>• Live-line tester</li> <li>• Electrical safety               <ul style="list-style-type: none"> <li>- Electric shock</li> <li>- Electrocution</li> <li>- Arc flash</li> </ul> </li> <li>• Documents works</li> </ul>	materials using both hot sticks and bare hand methods based on TESDA training regulations.	on TESDA training regulations.	1.3 Accomplish completing/filling out energized electrical work permit.	
<ul style="list-style-type: none"> <li>• Live-line maintenance tools, materials, equipment and hardware</li> <li>• PPE</li> <li>• Checking of tools equipment and materials. .</li> </ul>			<b>LO 2. Prepare hardware, transmission line tools and equipment.</b> 2.1 Identify and obtain Personal Protective Equipment (PPE) following job requirements. 2.2 Acquire and secure transmission line tools, equipment and hard-ware in line with job requirements. 2.3 Check/Inspect emergency restoration structures, tools, equipment and hardware.	<b>TLE_IATLIM9-12PLMW-II-18</b>
<ul style="list-style-type: none"> <li>• Live-line maintenance procedure.</li> <li>• National Fire Protection Association ( NFPA 70e )               <ul style="list-style-type: none"> <li>- Energized electrical work permit</li> <li>- Insulated tools</li> <li>- PPE ratings based on hazard</li> <li>- Human risk category</li> <li>- Flash protection boundaries</li> <li>- Approach distances</li> </ul> </li> <li>• Electrical high voltage safety</li> <li>• Housekeeping</li> </ul>			<b>LO 3. Perform live-line maintenance procedure.</b> 3.1 Perform live-line maintenance work procedure in accordance with the job requirements. 3.2 Show familiarity with and apply NFPA 70e live-line maintenance procedure. 3.3 Perform electrical high voltage safety procedure when working on high voltage system. 3.4 Perform housekeeping procedure in line with power industry procedure.	<b>TLE_IATLIM9-12PLMW-III-IV-I-IV-19</b>

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(640 Hours)

RESOURCES			METHODOLOGY	ASSESSMENT METHOD
TOOLS	EQUIPMENT	MATERIALS		
<ul style="list-style-type: none"> <li>• Pliers</li> <li>• Ball peen hammers</li> <li>• Screwdrivers</li> <li>• Hacksaw</li> <li>• Adjustable wrenches</li> <li>• Auger bit</li> <li>• Cutting tools (hydraulic, acetylene, bolo)</li> <li>• Hotline trailer</li> <li>• Digging tools (straight shovel, spoon, digging bar, hole digger, garden shovel)</li> <li>• Steel tape</li> <li>• Tele-height meter</li> </ul>	<ul style="list-style-type: none"> <li>• Ratchet hoist</li> <li>• Capstan/Hand winch (includes tightener)</li> <li>• Block and tackle</li> <li>• Compression tool</li> <li>• Snatch block</li> <li>• Climbing gears set</li> <li>• Dynamometer/ Tension meter</li> <li>• Wire grip/cum-along</li> <li>• Hydraulic cutter</li> <li>• Leakage-current monitoring kit (hot stick tester/la</li> <li>• Line truck</li> <li>• Boom truck</li> <li>• ERS gin pole (with complete accessories)</li> <li>• Nylon rope</li> <li>• Stringing roller</li> <li>• Webbing sling/nylon</li> <li>• Splicing machine</li> </ul> <p><b>Personal Protective Equipment</b></p> <ul style="list-style-type: none"> <li>• Hard hat</li> <li>• Safety shoes</li> <li>• Safety goggles</li> <li>• Conductive suit</li> <li>• Safety gloves</li> <li>• First-aid kit set</li> </ul>	<ul style="list-style-type: none"> <li>• T/L Insulator</li> <li>• Machine bolts</li> <li>• Suspension clamps</li> <li>• Strain clamp</li> <li>• Overhead ground wires</li> <li>• Cross arms and braces</li> <li>• Conductors and accessories</li> <li>• Tower parts</li> <li>• Emergency Restoration Structure (ERS)</li> <li>• Poles (assorted)</li> </ul>	<ul style="list-style-type: none"> <li>• Modular ( self pace )</li> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration</li> <li>• Viewing multimedia</li> <li>• Simulation</li> <li>• Industry immersion.</li> <li>• Hands on practice</li> </ul>	<ul style="list-style-type: none"> <li>• Interview (oral questioning)</li> <li>• Observations in workplace</li> <li>• Demonstration of practical skills</li> <li>• Portfolio (outputs/ credentials)</li> <li>• Written test / computer – based examination.</li> <li>• Third party report</li> </ul>

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**GLOSSARY**

1. ACSR (Aluminum Cable Steel Reinforcer) - a cable type having aluminum strands and a core of one or more steel strands. ACSRs are primarily used for medium and high voltage lines and may also be used for overhead services for individual customers.
2. Aerial cable - insulated cable usually supported by a bare cable, for power transmission above ground.
3. Air gap - the shortest air space between two contacts exposed above an insulating barrier.
4. Armor rod - an outer metal layer applied to a cable for mechanical protection. Armor rods are comprised of factory-formed wire, designed to be applied to a range of conductor size.
5. Armor rod (preformed) - a spiral-formed aluminum rod, a group of which is placed around a conductor at the point of suspension to minimize vibration and to protect the conductor from burning in case of a flashover.
6. Block and tackle - an apparatus of pulley blocks and ropes or cables used for hauling and hoisting heavy objects.
7. Damper - a device used to inhibit the vibration of conductors on a transmission line.
8. Groundman - a person working at ground level in support of a lineman working aloft.
9. Guy - a rope, cord, or cable used to steady, guide, or secure something.
10. Guy-wire or guy-rope - a tensioned cable designed to add stability to structures (frequently ship masts, radio masts, wind turbines, utility poles, and tents). One end of the cable is attached to the structure, and the other is anchored to the ground at a distance from the structure's base.
11. Guy strain insulator - an insulator, normally porcelain, used to electrically isolate one part of a down guy from another. Guy strain insulators are made of porcelain products.
12. Hazard - a dangerous condition, potential or inherent, that can bring about an interruption or interfere with the expected orderly progress of an activity.
13. Hazardous - an atmosphere that may expose employees to the risk of death, atmosphere incapacitation, impaired ability to self-rescue unaided, injury, or acute illness.
14. Hazardous atmospheres - include flammable gas, vapor, or mist, airborne combustible dust, oxygen concentration below 19.5 percent or above 23.5 percent, concentrations of substances that exceed dose or permissible exposure limits, or other atmospheric condition immediately dangerous to life or health.
15. Hot line order - a statement with documentation from the operations supervisor to the job supervisor that specific work may be done on or near a line or other equipment without requiring that it be disconnected from all sources of energy. The equipment is to be considered energized or "hot."
16. Hot stick - an insulated stick, usually made of fiberglass, that is used to work energized overhead conductors and operate electrical equipment that is overhead, underground and pad-mounted.
17. Insulator - a device that is used to electrically isolate a conductor or electrical device from ground or a different electrical potential. Insulators must support the conductors and withstand both the normal operating voltage and surges due to switching and lighting. Insulators are broadly classified as either pin-type, which supports the conductor above the structure, or suspension type, where the conductor hangs below the structure. Up to about 33 kV (69 kV in North America) both types are commonly used. At higher voltages only suspension-type insulators are common for overhead conductors. Insulators are usually made of wet-process porcelain or toughened glass, with increasing use of glass-reinforced polymer insulators.

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18. Lineman
  - a payroll classification or title given to a craftsperson whose duties include climbing wood poles or steel structures to perform work on electric power transmission and distribution circuits.
19. Overhead power line
  - an electric power transmission line suspended by towers or poles. Since most of the insulation is provided by air, overhead power lines are generally the lowest-cost method of transmission for large quantities of electric power. Towers for support of the lines are made of wood (as-grown or laminated), steel (either lattice structures or tubular poles), concrete, aluminum, and occasionally reinforced plastics. The bare wire conductors on the line are generally made of aluminum (either plain or reinforced with steel or sometimes composite materials), though some copper wires are used in medium-voltage distribution and low-voltage connections in customer premises.
20. Personal Protective Equipment (PPE)
  - the term includes, but is not limited to, devices designed to be worn by workers for eye, face, head, respiratory, hand, arm, body, leg, foot, and fall protection.
21. Tag line
  - rope used to control the position of equipment being lifted. This is not to be confused with the rope used to actually lift the equipment.
22. Transmission line
  - the material medium or structure that forms all or part of a path from one place to another for directing the transmission of energy, such as electromagnetic waves or acoustic waves, as well as electric power transmission. Components of transmission lines include wires, coaxial cables, dielectric slabs, optical fibers, electric power lines, and waveguides.
23. Low voltage
  - less than 1000 volts, used for connection between a residential or small commercial customer and the utility
24. Medium voltage (Distribution)
  - between 1000 volts (1 kV) and to about 33 kV, used for distribution in urban and rural areas
25. High voltage (Sub-transmission if 33-115kV and transmission if 115kV+)
  - between 33 kV and about 230 kV, used for sub-transmission and transmission of bulk quantities of electric power and connection to very large consumers
26. Extra high voltage (Transmission)
  - over 230 kV, up to about 800 kV, used for long distance, very high power transmission
27. Ultra high voltage
  - higher than 800 kV

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**CODE BOOK LEGEND**

Sample: **TLE\_IATLIM9-12PTPE-Ia-e-1**

LEGEND		SAMPLE	
<b>First Entry</b>	Learning Area and Strand/ Subject or Specialization	Technology and Livelihood Education_ Industrial Arts Transmission Line Installation and Maintenance NC II	<b>TLE_IA TLIM 9-12</b>
	Grade Level	9/10/11/12	
<b>Uppercase Letter/s</b>	Domain/ Content/ Component/ Topic	Performing Transmission Line Pole Erection	<b>PTPE</b>
			-
<b>Roman Numeral</b> <i>*Zero if no specific Quarter</i>	Quarter	First Quarter	<b>I</b>
<b>Lower case letter/s</b> <i>*Put an en-dash (-) in between letters to indicate more than a specific week</i>	Week	Week one to five	<b>a-e</b>
			-
<b>Arabic Number</b>	Competency	Plan and prepare work.	<b>1</b>

DOMAIN / COMPONENT	CODE
Performing Transmission Line Pole Erection	PTPE
Performing Overhead Transmission Line Work	POTW
Performing Cold Line Maintenance Work	PCMW
Performing Ground Line Maintenance Work	PGMW
Installing Emergency Restoration Structure	IMRS
Performing Live - Line Maintenance Work	PLMW

Technology-Livelihood Education and Technical-Vocational Track specializations may be taken between Grades 9 to 12.

Schools may offer specializations from the four strands as long as the minimum number of hours for each specialization is met.

Please refer to the sample Curriculum Map on the next page for the number of semesters per Industrial Arts specialization and those that have pre-requisites. Curriculum Maps may be modified according to specializations offered by a school.

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SAMPLE INDUSTRIAL ARTS CURRICULUM MAP\*\* (as of May 2016)

GRADE 7/8 (EXPLORATORY)		GRADES 9-12		
EXPLORATORY		Automotive Servicing (NC I)* <small>updated based on TESDA Training Regulations published December</small>		8 sems
		*Automotive Servicing (NC II)		8 sems
		Motorcycle/Small Engine Servicing (NC II) 4 sems	Driving (NC II) 2 sems	
		Electronic Products Assembly and Servicing (NC II)* <small>updated based on TESDA Training Regulations published December 28, 2013</small>		8 sems
			*Mechatronics Servicing (NC II)	4 sems
			*Instrumentation Control and Servicing (NC II)	4 sems
		Electrical Installation and Maintenance (NC II)		8 sems
			*Electrical Power Line Distribution Line Construction (NC II)	4 sems
		*Transmission Line Installation and Maintenance (NC II)		8 sems
		Machining (NC I)		8 sems
		*Machining (NC II)		8 sems
		Plumbing (NC I) 4 sems	*Plumbing (NC II)	4 sems
		Domestic Refrigeration and Air-conditioning Servicing (NC II)		8 sems
		*Refrigeration and Air-conditioning Servicing (PACU/CRE) (NC III)		8 sems
		Shielded Metal Arc Welding (NC I) 4 sems	*Shielded Metal Arc Welding (NC II)	4 sems
			*Gas Metal Arc Welding (GMAW) (NC II)	4 sems
			*Gas Tungsten Arc Welding (GTAW) (NC II)	4 sems
		Carpentry (NC II)		8 sems
		*Carpentry (NC III) 4 sems	Construction Painting (NC II) 2 sems	
		Furniture Making (Finishing) (NC II)		8 sems
	Masonry (NC II) 4 sems	Tile Setting (NC II)	4 sems	

\* Please note that these subjects have pre-requisites mentioned in the CG.

+ CG updated based on new Training Regulations of TESDA.

Other specializations with no prerequisites may be taken up during these semesters.

Pre-requisites of the subjects to the right should be taken up during these semesters.

**\*\*This is just a sample. Schools make their own curriculum maps considering the specializations to be offered. Subjects may be taken up at any point during Grades 9-12.**



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**Reference:**

Technical Education and Skills Development Authority-Qualification Standards Office. *Training Regulations for Transmission Line Installation and Maintenance NC II*. Taguig City, Philippines: TESDA, 2009.