

K TO 12 BASIC EDUCATION CURRICULUM
JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD TRACK AND SENIOR HIGH SCHOOL – TECHNICAL-VOCATIONAL LIVELIHOOD TRACK
INDUSTRIAL ARTS - MACHINING 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

	Specialization	Number of Hours	Pre-requisite
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

	Specialization	Number of Hours	Pre-requisite
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

	Specialization	Number of Hours	Pre-requisite
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)

	Specialization	Number of Hours	Pre-requisite
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: Machining NC I

Course Description:

This course is designed to enhance the knowledge, desirable attitudes and skills of a machinist in accordance with industry standards. It covers the following core competencies: performing bench work operation (basic and complex), turning work piece (basic and intermediate), milling work piece (basic and intermediate), and grinding work piece (basic and complex).

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
Introduction				
<ol style="list-style-type: none"> 1. Basic concepts in Machining 2. Relevance of the course 3. Career opportunities 	The learner demonstrates an understanding of the basic concepts, and underlying theories in Machining	The learner independently demonstrates the common competencies in Machining as prescribed by TESDA Training Regulations.	<ol style="list-style-type: none"> 1. Explain basic concepts in Machining. 2. Discuss the relevance of the course. 3. Explore career opportunities in Machining. 	
PERSONAL ENTREPRENEURIAL COMPETENCIES AND SKILLS (PECS)				
<ol style="list-style-type: none"> 1. Assessment of Personal Entrepreneurial Competencies and Skills (PECS) vis-à-vis a practicing entrepreneur/employee <ol style="list-style-type: none"> 1.1 Characteristics 1.2 Attributes 1.3 Lifestyle 1.4 Skills 1.5 Traits 2. Analysis of one's PECS 	The learner demonstrates an understanding of one's Personal Entrepreneurial Competencies and Skills (PECS).	The learner recognizes his/her Personal Entrepreneurial Competencies and Skills (PECS) and prepares a list of PECS of a practitioner/entrepreneur in SMAW.	LO 1. Recognize Personal Entrepreneurial Competencies and Skills (PECS) needed in Machining. <ol style="list-style-type: none"> 1.1 Assess one's PECS: characteristics, attributes, lifestyle, skills, and traits. 1.2 Assess practitioner's characteristics, attributes, lifestyle, skills, and traits. 1.3 Compare one's PECS with that of a practitioner /entrepreneur. 	TLE_PECS9-12-00-1
ENVIRONMENT AND MARKET (EM)				
<ol style="list-style-type: none"> 1. Key concepts of Environment and Market 2. Products & services available in the market 3. Differentiation of products and services 4. Customers and their buying habits 5. Competition in the market 6. SWOT Analysis 	The learner demonstrates an understanding of the concepts <i>environment</i> and <i>market</i> that relate to a career choice in Machining.	The learner independently generates a business idea based on the analyses of the environment and market in Machining	LO 1. Generate a business idea that relates with a career choice in Machining. <ol style="list-style-type: none"> 1.1 Conduct SWOT analysis. 1.2 Identify the different products/services available in the market. 1.3 Compare different products/services in Machining business. 1.4 Determine the profile potential customers. 1.5 Determine the profile potential competitors. 1.6 Generate potential business idea based on the SWOT analysis. 	TLE_EM9-12-00-1

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LESSON 1: PERFORMING BENCH WORK –BASIC (PBW)				
<ul style="list-style-type: none"> • Identification of layout tools • Preparation of layout tools • Procedures in laying out work piece • Safety measure in laying out 	The learner demonstrates an understanding of the basic concepts and underlying theories in layout and mark dimensions on a work piece.	The learner independently performs bench work operation based on industry standard.	LO 1. Layout, mark dimensions/features on work piece. 1.1 Identify layout tools. 1.2 Select layout tools in accordance with the working drawing. 1.3 Perform layout procedures according to industry standard. 1.4 Follow safety standards in layout.	TLE_IAMAC9-12PBW-Ia-e-1
<ul style="list-style-type: none"> • Types of cutting tools • Preparation of materials to be cut • Methods of cutting flat, rectangular and round blocks • Kinds of chipping tools • Preparation of materials to be chipped • Procedures in chipping flat rectangular and round blocks • Types of files • Selection of appropriate files • Preparation of materials for filing • Methods of filing • Application of safety measures in cutting chipping and filing 	The learner demonstrates, an understanding of the basic concepts and underlying theories in cutting, chipping and filing flat, rectangular or round blocks.		LO 2. Cut, chip, and file flat, rectangular or round blocks. 2.1 Cut material within specified tolerance. 2.2 Select appropriate chipping tools for the job. 2.3 Prepare materials for chipping according to requirements. 2.4 Perform chipping rectangular and round block according to standard procedure. 2.5 Apply method of chipping according to working drawing. 2.6 Select appropriate types of files to polish flat, rectangular or round blocks. 2.7 Prepare materials for filing according to requirements. 2.8 Apply methods of cutting chipping and filing according to working drawing. 2.9 Apply safety measures in cutting, chipping and filing.	TLE_IAMAC9-12PBW-If-j-2
<ul style="list-style-type: none"> • Identification of drilling machine • Selection of drill bit according to working drawing • Selection of required rpm according to the working drawing • Drilling of hole according to industry standard 	The learner demonstrates an understanding of the basic concepts and underlying theories in drilling, reaming and lapping the hole.		LO 3. Drill, ream and lap hole Identify drilling machine. 3.1 Select speed and feed appropriate for the drill size and kind of materials. 3.2 Drill work piece according to specification. 3.3 Prepare tools and materials based on operation to be performed specified on	TLE_IAMAC9-12PBW-IIa-e-3

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> • Kinds of reamer • Selection of required reamer according to specification • Procedure in reaming • Safety practices in drilling and reaming 			working drawing. 3.4 Select reamers according to the industry standard. 3.5 Ream the hole in accordance with the working drawing specification. 3.6 Follow safety practices in drilling and reaming. 3.7 Wear personal protective equipment.	
LESSON 2: TURNING WORK PIECE –BASIC (TWP)				
<ul style="list-style-type: none"> • Plans/drawing interpretation • Lathe work holding devices • Cutting tools accessories and their uses • Safety in handling tools and equipment • Checking procedure of machine guards, coolant and dust extraction devices 	The learners demonstrates an understanding of the basic concepts and underlying theories in determining job requirements.	The learners independently perform turning work piece (basic) based on industry standard.	LO 1. Determine job requirements. 1.1 Interpret plans/ drawings or blueprint. 1.2 Determine sequence of operation to produce component of specification. 1.3 Select holding devices according to the requirements. 1.4 Inspect tools according to manufacturer’s specification. 1.5 Check machine guards, coolant and dust extraction devices according to manufacturers manual.	TLE_IAMAC9-12TWP-IIIf-j-4
<ul style="list-style-type: none"> • Tools and equipment used in mounting a work piece • Setting up procedures of a work piece • Instrument and equipment used in setting up a work piece • Setting-up operations and safety procedures in handling of tools, instrument and equipment 	The learner demonstrates an understanding of the basic concepts and underlying theories in setting up a work piece.		LO 2. Set up work piece. 2.1 Mount a work piece in chuck into required level of accuracy using tools and equipment in accordance with work site procedure. 2.2 Set up a work piece to required level of accuracy using instrument/ equipment according to work site procedures. 2.3 Perform set-up operations applying knowledge in safety procedures and using personal protective devices.	TLE_IAMAC9-12TWP-IIIIa-h-5
<ul style="list-style-type: none"> • Formulas in solving speed and feed in turning operations. • Lathe accessories and their uses. • Procedures of the different 	The learner demonstrates an understanding of the basic concepts and underlying theories in performing turning		LO 3. Perform turning operations. 3.1 Calculate speed and feeds using appropriate mathematical techniques and reference materials. 3.2 Use lathe accessories appropriate to the	TLE_IAMAC9-12TWP-IIIIh-j-IV-6

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lathe operations <ul style="list-style-type: none"> • Procedures and techniques in measuring a work piece • Safety procedure in lathe operations 	operation, checking and measuring a work piece.		requirements of the operations. 3.3 Perform lathe operations to produce component of specifications in the working drawing. 3.4 Check work piece conforming to specifications using appropriate techniques, measuring tools and equipment. 3.5 Apply knowledge in safety procedures and use personal protective devices.	
LESSON 3: MILLING WORK PIECE – BASIC (MWP)				
<ul style="list-style-type: none"> • Plans/ drawing interpretation • Process planning • Kinds and uses of cutting tools and work holding devices • Safety practices • Instrument and equipment used in setting up a work piece • Setting-up operations and safety procedures in handling of tools, instrument and equipment 	The learner demonstrates an understanding of the basic concepts and underlying theories in setting up a work piece.		LO 1. Set up a work piece. 1.1 Interpret plans/ drawing to produce component of specification. 1.2 Determine sequence of operation to produce component of specification. 1.3 Select cutting tools and work holding devices according to job requirement. 1.4 Set up a work piece to the required level of accuracy using instrument/equipment according to work site procedure. 1.5 Perform set-up operation applying knowledge in safety procedures and using personal protective devices.	TLE_IAMAC9-12MWP-Ia-h-7
<ul style="list-style-type: none"> • Formulas for speeds and feeds • Milling machine accessories and their uses • Milling machine operations • Safety in operating a milling machine • Procedure and techniques in measuring a work piece 	The learner demonstrates an understanding of the basic concepts and underlying theories in performing milling operations and checking /measuring a work piece.		LO 2. Perform milling operation. 2.1 Set speeds and feeds appropriate to the job. 2.2 Use milling machine accessories appropriate to the requirements of the operation. 2.3 Perform milling operations to produce component to specifications in the blue print. 2.4 Apply milling operations with safety procedures and use personal protective devices. 2.5 Check work piece measurement for conformity in specification using appropriate techniques, measuring tools and equipment.	TLE_IAMAC9-12MWP-Ih-j-II-IIIa-e-8

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
LESSON 4: GRINDING WORKPIECE – BASIC (GWP)				
<ul style="list-style-type: none"> • Parts and function of a grinding machine and accessories • Kinds of work holding devices in grinding • Types and grades of grinding wheels. • Checking procedure of machine guards, coolant and dust extraction devices • Safety practices 	The learner demonstrates an understanding of the basic concepts and underlying theories in setting up a work piece and machine accessories.	The learner independently performs grinding a work piece (basic) based on industry standard.	LO 1. Set up work piece and machine accessories 1.1 Determine parts and functions of a grinding machine. 1.2 Select grinding wheels in accordance with work requirement. 1.3 Select grinder accessories appropriate to the requirements of an operation. 1.4 Check machine guards, coolant and dust extractor device according to work site procedure.	TLE_IAMAC9-12GWP-III-f-j-9
<ul style="list-style-type: none"> • Setting-up procedure in grinding flat, square, parallel, angle, radii, groove and profiles • Procedure in grinding flat, parallel and square surfaces • Procedure in grinding angled surfaces • Procedure in grinding radii • Procedure in grinding grooves and profiles • Work holding devices appropriate for grinding • Safety practices in grinding • Procedures and techniques in measuring a work a piece 	The learner demonstrates an understanding of the basic concepts and underlying theories in performing grinding operations and measuring a work piece		LO 2. Perform grinding operation 2.1 Set-up grinding machine in accordance with the work specification. 2.2 Clamp a work piece to avoid damage. 2.3 Perform grinding operations safely to produce component to specification. 2.4 Measure a work piece using appropriate techniques, measuring tool and equipment.	TLE_IAMAC9-12GWP-IV-10
LESSON 5: PERFORMING BENCHWORK – COMPLEX (PBC)				
<ul style="list-style-type: none"> • Types of Honing tools Scrapers • Procedure in: Honing Scraping • Safety practices 	The learner demonstrates an understanding of the basic concepts and underlying theories in honing and scraping a surface	The learner independently performs a bench work operation (Complex) based on industry standard.	LO 1. Hone, scrape surface. 1.1 Perform honing operation in accordance with procedure. 1.2 Perform scraping according to procedure. 1.3 Perform honing and scraping operations applying knowledge in safety and using personal protective devices.	TLE_IAMAC9-12PBC-Ia-h-11

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> • Set of screw extractors • Procedure in removing worn-out bolt in a threaded hole • Procedure in repairing damaged threads • Safety practices 	<p>The learner demonstrates an understanding of the basic concepts and underlying theories in removing damaged bolt in the threaded hole.</p>		<p>LO 2. Remove damaged bolt in threaded hole.</p> <p>2.1 Determine screw extractors according to job requirements.</p> <p>2.2 Remove damaged bolt according to procedure</p> <p>2.3 Perform removal of damaged bolt in a threaded hole and repair damaged thread applying knowledge in safety and using personal protective devices.</p> <p>2.4 Repair damaged thread according to procedure.</p>	<p>TLE_IAMAC9-12PBC-Ih-j-IIa-e-12</p>
LESSON 6: TURNING WORK PIECE – INTERMEDIATE (TWI)				
<ul style="list-style-type: none"> • Kinds of cutting tools • Uses of work holding devices • Centering tools and device • Procedure in setting up a work piece • Safety practices for setting up a work piece 	<p>The learner demonstrates an understanding of the basic concepts and underlying theories in setting up a work piece.</p>	<p>The learner independently performs grinding a work piece (intermediate) based on industry standards.</p>	<p>LO 1. Set up a work piece.</p> <p>1.1 Select cutting tools and work holding devices.</p> <p>1.2 Center a work piece in accordance with work requirements.</p> <p>1.3 Set up a work piece on chuck to the required level of accuracy using tools and equipment in accordance with work site procedure.</p> <p>1.4 Perform set-up operations in accordance with approved safety procedures and practices.</p>	<p>TLE_IAMAC9-12TWI-IIIf-j-IIIa-c-13</p>
<ul style="list-style-type: none"> • Speeds, feeds and machining time calculations • Machine accessories and their uses. • Kinds of cutting tools • Uses of work holding devices • Centering tools and devices • Lathe operations procedures • Lathe safety practices • Procedure in setting up a work piece • Procedure and techniques in measuring work piece 	<p>The learner demonstrates an understanding of the basic concepts and underlying theories in performing turning operations.</p>		<p>LO 2. Perform turning operations</p> <p>2.1 Calculate speeds, feeds and machining time in accordance with job requirements</p> <p>2.2 Use lathe accessories appropriate to the requirements of the operation.</p> <p>2.3 Perform lathe operations to produce part according to specifications.</p> <p>2.4 Apply knowledge in safety procedures and using personal protective devices.</p> <p>2.5 Check work piece measurement as per specification.</p>	<p>TLE_IAMAC9-12TWI-IIIf-j-IIIc-j-IV-14</p>

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
LESSON 7: MILLING WORK PIECE – INTERMEDIATE (MWI)				
<ul style="list-style-type: none"> • Interpretation working drawing • Procedure in setting up a work piece • Speeds and feeds calculation • Milling machine accessories and their uses • Kinds of cutting tools • Uses of work holding devices • Safety practices 	The learner demonstrates an understanding of the basic concepts and underlying theories in setting up work piece.	The learner independently performs milling work piece (intermediate) based on industry standards.	LO 1. Set up work piece. 1.1 Interpret plans/drawing to produce component of specification. 1.2 Select cutting tools and work holding devices according to job requirement. 1.3 Perform set up operation in accordance with safety procedures and practices.	TLE_IAMAC9-12MWI-Ia-h-15
<ul style="list-style-type: none"> • Formulas for speeds and feeds • Milling machine accessories and their uses • Milling machine operations • Safety procedures in milling operation • Procedure and techniques in measuring a work piece 	The learner demonstrates an understanding of the basic concepts and underlying theories in performing milling operations and checking work piece measurement.		LO 2. Perform milling operations and check work piece. 2.1 Set speeds and feeds according to job requirement. 2.2 Use milling machine accessories according to job requirements. 2.3 Perform milling operations according to established procedure. 2.4 Check work piece measurement as per specification.	TLE_IAMAC9-12MWI-Ih-j-II-IIIa-e-16
LESSON 8: GRINDING WORKPIECE - COMPLEX OPERATION (GWC)				
<ul style="list-style-type: none"> • Working drawing interpretation • Selection of grinding operations • Selection of holding devices • Selection of wheels • Selection of accessories • Safe handling of tool, equipment and materials • Inspect grinding wheel • Checking procedure of machine guards, coolant and dust extraction devices • Shop safety practices 	The learner demonstrates an understanding of the basic concepts and underlying theories in selecting wheels and accessories.	The learner independently performs grinding a work piece (complex) based on industry standard.	LO 1. Select wheels and accessories 1.1 Interpret working drawing to produce component according to specifications 1.2 Select work holding device according to operation requirements. 1.3 Inspect grinding wheel to the required shape and size. 1.4 Select accessories according to job requirement. 1.5 Check machine guards, coolant and dust extractor according to work site procedure.	TLE_IAMAC9-12GWC-IIIf-j-IVa-b-17

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> • Adjusting grinding machine set up • Grinding operations of • external and internal tapers <ul style="list-style-type: none"> - internal radii - internal recess - remove warp • Proper use of: <ul style="list-style-type: none"> - holding devices - wheels and accessories - materials - coolant • procedures and techniques in measuring work piece • Shop safety practices • Safe handling of tool, equipment and 	<p>The learner demonstrates an understanding of the basic concepts and underlying theories in performing grinding operations.</p>		<p>LO 2. Perform grinding operations.</p> <p>2.1 Adjust grinding machine set up in accordance with the work site procedure</p> <p>2.2 Clamp or hold the work piece to avoid damage</p> <p>2.3 Perform grinding operations with safety to produce component to specification</p> <p>2.4 Measure the work piece for conformity in specification using appropriate techniques, measuring tool and equipment.</p>	<p>TLE_IAMAC9-12GWC-IVb-j-18</p>

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RESOURCES		
TOOLS AND EQUIPMENT	SUPPLIES AND MATERIALS	LEARNING MATERIALS
<ul style="list-style-type: none"> • Hand hack saw • Power hack saw • Metal band saw • Lathe machine <ul style="list-style-type: none"> - Lathe accessories - 3-jaw chuck - 4-jaw chuck - Collect chuck - Face plate - Drill chuck - Lathe center - Steady rest - Follower rest - Cutting tools • Drill press • Electric hand drill • Milling machine • Shaper machine • Surface grinder • Bench Grinder • Angle disc grinder • Veeblock with clamp • Surface plate • Sine bar • Dial indicator • Universal bevel protractor • Drill press • Bevel protractor • Hermaphrodite • Prick punch • Hammer • Steel rule • Scriber 	<ul style="list-style-type: none"> • Paper • Pencil • Triangles • Pencil & paper • Drawing table • Protractor • Brush • Light oil • Oil can • Dust pan • Grease gun • Clean rags • Calculator • Measuring instrument • Work piece (mild steel plate, rectangular and round block) • Layout tools • Small hole gauge • Drill bit • Go-no-go gauge • Telescopic gauge • Vernier caliper • Micrometer caliper • Reamer holder • Working bench w/ vise • Paint brush • Grinding coolant • Tool bit gauge • V-block • Brass shim • Apron • Gloves • Safety glass 	<ul style="list-style-type: none"> • References (books) • Manuals • Mathematics books • Formulas of speed and feed • Table for speed and feed • Maintenance chart • Working drawing

K TO 12 BASIC EDUCATION CURRICULUM
JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD TRACK AND SENIOR HIGH SCHOOL – TECHNICAL-VOCATIONAL LIVELIHOOD TRACK
INDUSTRIAL ARTS - MACHINING NC II
(640 hours)

RESOURCES

TOOLS AND EQUIPMENT	SUPPLIES AND MATERIALS	LEARNING MATERIALS
<ul style="list-style-type: none"> • Divider • Tool blank • Milling cutters • Lecture • Reportorial • Group discussion • Interaction • Demonstration • Film viewing • Self-paced learning • Plant visitation 	<ul style="list-style-type: none"> • Spanner wrench • Combination square • Height gauge • Angular plate • Square block • Interview • Written • Practical exercise • Direct observation 	

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GLOSSARY

- | | |
|----------------------------|--|
| 1. Lathe Machine | - is a machine where the work piece rotates against the tool bit. |
| 2. Faceplate and lathe dog | - are work-holding devices used in turning between centers. |
| 3. Bed | - the foundation or base on which the other parts of the lathe are fitted. |
| 4. Head stock | - it contains the spindle to which the various work-holding attachments are fitted |
| 5. Danger | - something that may cause injury |
| 6. Emergency | - a dangerous happening or situation |
| 7. Hazard | - a risk of harm or danger. |
| 8. Injury | - an instance of harm or damage |
| 9. Safety measure | - taking measure to prevent accident |

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CODE BOOK LEGEND

Sample: **TLE_IA-MAC11-PBW-Ia-c-1**

LEGEND		SAMPLE	
First Entry	Learning Area and Strand/ Subject or Specialization	Technology and Livelihood Education_ Industrial Arts Machining NC II	TLE_IA MAC 9-12
	Grade Level	9/10/11/12	
Uppercase Letter/s	Domain/ Content/ Component/ Topic	Performing Bench Work - Basic	PBW
-			
Roman Numeral <i>*Zero if no specific Quarter</i>	Quarter	First Quarter	I
Lower case letter/s <i>*Put an en-dash (-) in between letters to indicate more than a specific week</i>	Week	Week one to five	a-e
-			
Arabic Number	Competency	Layout, mark dimensions/ features on work piece	1

DOMAIN / COMPONENT	CODE
Performing Bench Work – Basic	PBW
Turning Work Piece - Basic	TWP
Milling Work Piece - Basic	MWP
Grinding Work Piece - Basic	GWP
Performing Bench Work - Complex	PBC
Turning Work Piece - Intermediate	TWI
Milling Work Piece - Intermediate	MWI
Grinding Work Piece - Complex Operation	GWC

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 Machining NC II*. Taguig City, Philippines: TESDA, 2011.