

K to 12 BASIC EDUCATION CURRICULUM
JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD EDUCATION AND SENIOR HIGH SCHOOL TECHNICAL-VOCATIONAL-LIVELIHOOD TRACK
INDUSTRIAL ARTS - AUTOMOTIVE SERVICING NC I
(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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Course Description:

This course is designed to develop knowledge, skills, and desirable attitudes of an individual in the field of **Automotive Servicing** National Certificate Level I (NCI). The student is expected to demonstrate **common competencies** in applying appropriate sealant adhesive; move and position vehicle; perform mensuration and calculation; read, interpret, and apply specification manual; use and apply lubricant and coolant; perform shop maintenance; prepare job estimate/costing; interpret/draw technical drawing; practice health, safety, and environment procedures; inspect technical quality of work; maintain quality system; and identify and select original automotive parts and products. It also includes the development of **core competencies** such as performing gas engine tune-up; performing diesel engine tune-up; removing and replacing electrical/electronic units/assemblies; removing and tagging engine system components; removing and tagging steering, suspension, and brake system components; and removing and tagging transmission system components.

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
Introduction 1. Basic concepts in automotive servicing 2. Relevance of the course 3. Career opportunities	The learners demonstrate an understanding of the basic concepts and underlying theories in automotive servicing	The learners shall be able to demonstrate common competencies in automotive servicing as prescribed by TESDA Training Regulations	The learners... 1. Explain basic concepts in automotive servicing 2. Discuss the relevance of the course 3. Explore career opportunities in automotive servicing	
PERSONAL ENTREPRENEURIAL COMPETENCIES (PECs)				
1. Assessment of Personal Competencies and Skills (PECs) vis-à-vis PECs of a practicing entrepreneur/employee 1.1 Characteristics 1.2 Attributes 1.3 Lifestyle 1.4 Skills 1.5 Traits 2. Analysis of PECs compared to those of a practitioner 3. Align one's PECs based on the results of the assessment	The learners demonstrate an understanding of one's PECs in automotive servicing	The learners shall be able to prepare an activity plan that aligns with the PECS of a practitioner/entrepreneur in automotive servicing	LO 1. Recognize Personal Entrepreneurial Competencies and Skills (PECs) needed in automotive servicing 1.1 Compare one's PECs with those of a practitioner/entrepreneur 1.2 Align one's PECs with those of a practitioner/entrepreneur 1.3 Assess one's PECs 1.4 Assess practitioner's PECs	TLE_PECs7-12-00-1
1. Strengthening and developing further one's PECs	The learners demonstrate an understanding of one's PECs in automotive servicing	The learners shall be able to create a plan of action that strengthens/develops one's PECs in automotive servicing	LO 2. Develop and strengthen personal competencies and skills (PECs) needed in automotive servicing	TLE_PECs7-12-00-2

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			2.1 Identify areas for improvement, development and growth 2.2 Align one's PECs according to his/her business/career choice 2.3 Create a plan of action that ensures success of his/her business/career choice	
ENVIRONMENT AND MARKET (EM)				
Market (Town) 1. Key concepts of market 2. Players in the market (competitors) 3. Products & services available in the market	The learners demonstrate an understanding of the concepts of environment and market and how they relate to the field of automotive servicing, particularly in one's town/ municipality	The learners shall be able to create a business vicinity map reflective of the potential automotive servicing market in the locality/town	LO 1. Recognize and understand the market in automotive servicing 1.1 Identify the players/ competitors within the town 1.2 Identify the different products/services available in the market	TLE_EM7-12-00-1
Market (customer) 1. Key concepts in identifying and understanding the consumer 2. Consumer analysis through: 2.1 Observation 2.2 Interviews 2.3 Focus group discussion (FGD) 2.4 Survey			LO 2. Recognize the potential customer/ market in automotive servicing 2.1 Profile potential customers 2.2 Identify the customer's needs and wants through consumer analysis 2.3 Conduct consumer/market analysis	TLE_EM7-12-00-2
1. Generating business ideas 1.1 Key concepts in generating business ideas 1.2 Knowledge, skills, passions, and interests 1.3 New applications 1.4 Irritants			LO 3. Create new business ideas in automotive servicing by using various techniques 3.1 Explore ways of generating business ideas from ones' own characteristics/attributes 3.2 Generate business ideas using product innovation from irritants, trends, and emerging needs 3.3 Generate business ideas using Serendipity	TLE_EM7-12-00-3

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
1.5 Striking ideas (new concepts) 1.6 Serendipity Walk			Walk	
1. Product development 2. Key concepts in developing a product 3. Finding Value 4. Innovation 4.1 Unique Selling Proposition (USP)	The learners demonstrate an understanding of concepts of environment and market and how they relate to automotive servicing, particularly in one's town/municipality	The learners shall be able to create a business vicinity map reflective of the potential automotive servicing market within the locality/town	LO 4. Develop a product/service in automotive servicing 4.1 Identify what is of "value" to the customer 4.2 Identify the customer 4.3 Explain what makes a product unique and competitive 4.4 Apply creativity and innovative techniques to develop marketable product 4.5 Employ a USP to the product/service	TLE_EM7-12-00-4
1. Selecting business idea 2. Key concepts in selecting a business idea 2.1 Criteria 2.2 Techniques			LO 5. Select a business idea based on the criteria and techniques set 5.1 Enumerate various criteria and steps in selecting a business idea 5.2 Apply the criteria/steps in selecting a viable business idea 5.3 Determine a business idea based on the criteria/techniques set	TLE_EM7-12-00-5
Branding			LO 6. Develop a brand for the product 6.1 Identify the benefits of having a good brand 6.2 Enumerate recognizable brands in the town/province 6.3 Enumerate criteria for developing a brand 6.4 Generate a clear appeal	TLE_EM7-12-00-6

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
COMMON COMPETENCIES				
LESSON 1: APPLYING APPROPRIATE SEALANT/ADHESIVE (AAS)				
<ul style="list-style-type: none"> • Use of sealant and adhesive • Types and classification of sealant and adhesives • Procedure in checking sealant / adhesive • Safety work procedures 	The learners demonstrate an understanding of concepts and underlying principles in applying appropriate sealant/adhesive	The learners shall be able to apply appropriate sealant/ adhesive based on industry standards	LO 1. Identify appropriate sealant/adhesive 1.1 Select sealant/adhesive in line with job requirements and manufacturer’s specifications 1.2 Perform sealant/adhesive checking to ensure the product is fit for use	TLE_IAAUTO9-12AAS-Ia-1
<ul style="list-style-type: none"> • Types of surface material and appropriate sealant/adhesive to be used • Techniques and procedures in preparing surfaces for sealant/adhesive • Safety in preparing different surfaces 			LO 2. Prepare surface for sealant/ adhesive application 2.1 Identify the types of sealant and adhesives according to surface 2.2 Clean surface free of moisture, dust, and other foreign matters to ensure maximum adhesion or seal	TLE_IAAUTO9-12AAS-Ia-2
<ul style="list-style-type: none"> • Applying sealant/adhesive in line with manufacturer’s specifications • Removing excess sealant/adhesive by sanding or scraping • Techniques in applying sealant/adhesive • Safety requirements in applying sealant/adhesive • Hazards and risk associated with the use of sealant/adhesive 			LO 3. Apply sealant/adhesive evenly 3.1 Apply sealant/adhesive evenly on the surface in line with manufacturer’s specifications 3.2 Removed excess sealant/adhesive by sanding or scraping 3.3 Apply sealant/adhesive using tools and equipment appropriate to job requirements 3.4 Observe safety and wear Personal Protective Equipment (PPE) in accordance with industry standard operating procedure (SOP). 3.5 Identify hazards associated with the use of sealant and adhesives.	TLE_IAAUTO9-12AAS-Ib-c-3

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<ul style="list-style-type: none"> • Sealant/adhesive storing procedures • Waste disposal standard procedures • Hazards associated with environment due to improper waste disposal 			<p>LO 4. Store unused and dispose of used sealant/adhesive</p> <p>4.1 Store sealant/adhesive as per prescribed procedure</p> <p>4.2 Dispose of waste as per workshop SOP</p>	<p>TLE_IAAUTO9-12AAS-Id-4</p>
LESSON 2: MOVING AND POSITIONING VEHICLE (MPV)				
<ul style="list-style-type: none"> • Checkup procedures <ul style="list-style-type: none"> - Oil level - Brake fluid - Clutch fluid - Coolant level - Battery (electrolyte) - Tire pressure - Position of driving gear - Lighting and warning devices 	<p>The learners demonstrate an understanding of concepts and underlying principles in moving and positioning vehicle</p>	<p>The learners shall be able to move and position vehicle based on industry standards</p>	<p>LO 1. Prepare the vehicle for driving</p> <p>1.1 Perform correct checkup procedures of engine system</p>	<p>TLE_IAAUTO9-12MPV-Id-e-5</p>
<ul style="list-style-type: none"> • Types of vehicles • Driving procedures and technique <ul style="list-style-type: none"> - manual transmission - automatic transmission • Safety signs and symbols in driving • Drivers code and conduct • Driving skills <ul style="list-style-type: none"> - Starting an engine - Shifting gears - Steering vehicle - Brake application 			<p>LO 2. Move and position vehicle</p> <p>2.1 Identify or select vehicle to be moved or repositioned as per job requirement</p> <p>2.2 Drive vehicle safely to the designated location according to job specification</p> <p>2.3 Park vehicle properly following safety procedures and techniques</p>	<p>TLE_IAAUTO9-12MPV-Id-j-6</p>

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> - Parking safety and technique - engaging of park brake - vehicle parking position - front wheel position 				
<ul style="list-style-type: none"> • Checking procedure of vehicle safe position • Checkup procedures upon parking <ul style="list-style-type: none"> - BLOWBAG • Types of vehicle external damages 			LO 3. Check the vehicle 3.1 Check vehicle position as per requirement 3.2 Perform checkup procedures upon parking 3.3 Check vehicle for external damage	TLE_IAAUTO9-12MPV-Ij-7
LESSON 3: PERFORMING MEASUREMENT AND CALCULATION (PMC)				
<ul style="list-style-type: none"> • Types of measuring instruments and applications • Reading scales of measuring instruments • Techniques in measuring parts/components. 	The learners demonstrate an understanding of concepts and underlying theories and principles in performing measurements and calculations	The learners shall be able to perform mensuration and calculation based on job requirements	LO 1. Select Measuring Instrument 1.1 Identify object or component to be measured 1.2 Obtain correct specifications from relevant source 1.3 Select appropriate measuring instrument as per job requirement	TLE_IAAUTO9-12PMC-IIa-c-8
<ul style="list-style-type: none"> • Conversion of units of measurement from English metric system and vice versa • Techniques in determining tolerance/allowance of parts/components • Calibration and using testing instruments • Solving problems using formulas • Finding areas of different geometrical figures 			LO 2. Carry out measurement and calculation 2.1 Select measuring tools in line with job requirements 2.2 Obtain accurate measurements with job requirements 2.3 Perform calculations needed to complete work/task using fundamental operation of mathematics 2.4 Use calculations involving fractions, percentage, and mixed numbers to complete workplace tasks	TLE_IAAUTO9-12PMC-IIc-h-9

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			2.5 Check correct and accurate numerical computation 2.6 Read instruments to the limit of accuracy of the tool	
<ul style="list-style-type: none"> • Cleaning of measuring instrument • Storing of measuring instruments • Techniques in using precise instrument • Safe handling of and caring for measuring instruments 			LO 3. Maintain measuring instrument 3.1 Keep measuring instruments free from corrosion 3.2 Do not drop measuring instrument to avoid damage 3.3 Clean measuring instrument before and after using	TLE_IAAUTO9-12PMC-IIh-j-10
LESSON 4: READING, INTERPRETING, AND APPLYING SPECIFICATION AND MANUAL (RIA)				
<ul style="list-style-type: none"> • Types of manuals used in automotive industry • Identifying appropriate manuals • Knowledge and techniques in accessing data and specification as per job requirement 	The learners demonstrate an understanding of concepts and underlying theories and principles in interpreting manuals of specifications in automotive servicing	The learners shall be able to read and interpret specification and manual	LO 1. Identify and access manual/ specifications 1.1 Identify and access appropriate manuals as per job requirement 1.2 Check version and date of manual to ensure correct specification and identify procedures	TLE_IAAUTO9-12RIA-III a-b-11
<ul style="list-style-type: none"> • Procedure / techniques in interpreting data and specifications • Identification of symbols used in the manuals • Identification of units of measurements 			LO 2. Interpret manuals 2.1 Locate relevant sections, chapters of manuals/ specifications in relations to the work to be conducted 2.2 Interpret information and procedure in the manual in accordance to industry practices	TLE_IAAUTO9-12RIA-III c-d-12

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<ul style="list-style-type: none"> • Interpreting appropriate data and specifications • Applying data and specification accessed from the manuals as required in the given task 			<p>LO 3. Apply information accessed in the manual</p> <p>3.1 Interpret data and specification according to job requirement</p> <p>3.2 Identify work steps correctly in accordance with manufacturer’s specification</p> <p>3.3 Apply manual data according to the given task</p> <p>3.4 Interpret all correct sequence and adjustment in accordance with information contained on the manual or specification</p>	<p>TLE_IAAUTO9-12RIA-IIIe-13</p>
<ul style="list-style-type: none"> • Techniques in storing manuals • Procedures in maintaining manuals 			<p>LO 4. Store manual</p> <p>4.1 Store manuals or specification appropriately to prevent damage</p> <p>4.2 Store manuals properly for easy access especially when updating information required in the given task</p>	<p>TLE_IAAUTO9-12RIA-IIIe-14</p>
LESSON 5: USING AND APPLYING LUBRICANT/COOLANT (UAL)				
<ul style="list-style-type: none"> • Lubrication schedules • Uses of coolants • Properties of lubricant and coolant • Types of lubricant and application • Hazards associated with lubricants • Techniques in applying coolant and lubricant 	<p>The learners demonstrate an understanding of using and applying lubricant/coolant</p>	<p>The learners shall be able to apply lubricant/coolant based on service manuals</p>	<p>LO 1. Identify types of lubricants/coolant</p> <p>1.1 Access and interpret correct information on lubrication schedule from appropriate manufacturer’s specifications manual</p> <p>1.2 Identify type and quantity of lubricants/coolant as per job requirements</p>	<p>TLE_IAAUTO9-12UAL-IIIIf-15</p>

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<ul style="list-style-type: none"> • Changing procedure of changing lubricant <ul style="list-style-type: none"> - Hazards associated with lubricant • Use and care of tools and equipment • Tools of coolant and lubricant application • Lubrication procedure • Hazards of coolant and lubricant in the environment • Proper disposal of coolant and lubricant • Techniques in handling lubricants • Personal safety procedures 			<p>LO 2. Use and apply lubricants/coolant</p> <p>2.1 Identify correct procedure for change of lubricant following manufacturer's specification or manual</p> <p>2.2 Select and use correct tools and equipment in line with job requirements</p> <p>2.3 Remove and replaced existing lubricants with specified types and quantity of new materials in line with manufacturer's specification</p> <p>2.4 Observe safe procedure and use of PPE when removing or replacing lubricant</p> <p>2.5 Dispose of used lubricants in accordance with environmental guidelines</p> <p>2.6 Check work in line with company SOP</p>	<p>TLE_IAAUTO9-12UAL-IIIg-i-16</p>
<ul style="list-style-type: none"> • Workshop policy and procedure • Maintenance and storage of shop cleaning equipment • Use and storage of cleaning chemicals • Shop safety practices • Housekeeping practices • 5S 			<p>LO 3. Perform housekeeping activities</p> <p>3.1 Store tools, equipment, and materials properly as per company SOP</p> <p>3.2 Free workplace from waste materials</p>	<p>TLE_IAAUTO9-12UAL-IIIj-17</p>
LESSON 6: PERFORMING SHOP MAINTENANCE (PSM)				
<ul style="list-style-type: none"> • Types and usage of cleaning chemicals/agents • Safe handling of equipment and tools • Service procedures 	<p>The learners demonstrate an understanding of concepts and underlying principles in performing shop maintenance</p>	<p>The learners shall be able to perform shop maintenance in accordance with OHS (occupational health and safety) procedures</p>	<p>LO 1. Inspect and clean tools, equipment and work area</p> <p>1.1 Inspect and clean tools, equipment, and work to ensure that they are free from dust, grease, and other substances</p>	<p>TLE_IAAUTO9-12PSM-IVa-18</p>

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> • Equipment maintenance standards • Procedures and techniques in cleaning work area 			1.2 Observe cleaning solvent used as per workshop cleaning requirements 1.3 Check and clean work area 1.4 Keep dry wet surface or spot in the work area	
<ul style="list-style-type: none"> • Safe storage of tools and equipment • Storage and disposal of hazardous/flammable tools/materials • Personal safety procedures • Relevant technical information for tools and equipment • Labeling procedures • Principles of total quality management (TQM) and 5S 			LO 2. Store/arrange tools and shop equipment. 2.1 Arrange and store tools and equipment in their respective shelves/location 2.2 Post visible corresponding labels 2.3 Secure and log tools in the record book	TLE_IAAUTO9-12PSM-IVa-b-19
<ul style="list-style-type: none"> • Effects of automotive waste on people men and the environment • Waste management and disposal • Cleaning chemicals for grease and lubricants • Labeling procedures and techniques 			LO 3. Dispose of waste and used lubricants 3.1 Dispose of waste and used lubricants in accordance with SOP and environmental regulations 3.2 Label containers for waste and used lubricants properly 3.3 Observe personal safety in disposal of waste and used lubricants	TLE_IAAUTO9-12PSM-IVb-20
<ul style="list-style-type: none"> • Conducting inventory and preparing records • Maintenance and safe handling of tools and equipment • Maintenance and updating of records and reports 			LO 4. Report damaged tools/equipment 4.1 Maintain complete inventory of tools and equipment 4.2 Identify damaged tools/equipment with repair recommendation 4.3 Prepare reports on damaged tools/equipment	TLE_IAAUTO9-12PSM-IVc-21

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
LESSON 7: PREPARING JOB ESTIMATE/COSTING (PJE)				
<ul style="list-style-type: none"> • Types of jobs procedures in preparing job estimates • Automotive repair procedures and techniques • Honesty, perseverance, patience, and attention to detail • Effective communication 	The learners demonstrate an understanding of concepts and underlying principles of preparing job estimate/costing	The learners shall be able to perform job estimating/costing	LO 1. Identify the nature and scope of work 1.1 Determine the nature and scope of work to be undertaken 1.2 Determine the extent of service to be undertaken in line with SOP	TLE_IAAUTO9-12PJE-IVc-d-22
<ul style="list-style-type: none"> • Replaceable and fabricated materials or spare parts in a vehicle • Procedures and techniques in estimating repair works and activities • Consumer mathematics • Computing using the four fundamental operations • Techniques in presenting estimates to the customer 			LO 2. Prepare and present estimate/costing 2.1 Identify the types and quantity of supplies, materials, and labor required to perform work in line with job requirements 2.2 Obtain cost of supplies and materials from the suppliers 2.3 Calculate total cost of required services in line with standard operating procedures 2.4 Present estimate to customer in line with SOP	TLE_IAAUTO9-12PJE-IVd-e-23
LESSON 8: INTERPRETING/DRAWING TECHNICAL DRAWING (ITD)				
<ul style="list-style-type: none"> • Safe handling of tools and consumables • Technical drawing details • Drawing symbols 	The learners demonstrate an understanding of concepts and underlying principles of interpreting/drawing technical drawings	The learners shall be able to interpret/execute technical drawing	LO 1. Interpret technical drawing 1.1 Recognize components and assemblies of objects 1.2 Recognize and interpret symbols 1.3 Identify appropriate dimensions 1.4 Follow instructions 1.5 Identify required materials and other consumables	TLE_IAAUTO9-12ITD-IVf-g-24
<ul style="list-style-type: none"> • Manufacturer's schematic diagram • Technical drawing manual 			LO 2. Select correct technical drawing 2.1 Validate drawings against job requirements and manuals	TLE_IAAUTO9-12ITD-IVg-h-25

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
			2.2 Check and validate drawing version according to manual	
<ul style="list-style-type: none"> Freehand sketching techniques Draw and interpret orthographic drawing Draw and interpret pictorial drawing 			LO 3. Apply freehand sketching 3.1 Produce correct freehand sketches using the necessary tools and materials	TLE_IAAUTO9-12ITD-IVh-j-26
LESSON 9: PRACTICING HEALTH, SAFETY, AND ENVIRONMENT PROCEDURES (PHSE)				
<ul style="list-style-type: none"> Implications of Occupational Health and Safety (OHS) on efficiency, morale, and customer relations OHS regulations /requirements, equipment, materials, and personal safety requirements Worksite policy Breakdown report Fire and safety hazards and precautions Selection and application of fire-fighting equipment Dangerous goods and hazardous chemicals handling process Proper handling of hazardous substances 	The learners demonstrate an understanding of concepts and underlying principles of practicing health, safety, and environment procedures	The learner shall be able to perform job in practicing health, safety, and environment procedures	LO 1. Apply basic safety procedures 1.1 Maintain policies and procedures to achieve a safe working environment in line with OHS 1.2 Report all unsafe situations according to worksite policy 1.3 Report all machinery and equipment breakdown to supervisor and/or to person in charge 1.4 Identify fire and safety hazards and precautions 1.5 Identify dangerous goods and substances 1.6 Follow worksite policy regarding manual handling of hazardous substances 1.7 Participate in consultative arrangements established by company	TLE_IAAUTO9-12PHSE-Ia-c-27
<ul style="list-style-type: none"> Emergency procedures in case of: <ul style="list-style-type: none"> Fire Flood 			LO 2. Apply emergency procedures 2.1 Identify worksite policies and emergency procedures regarding illness or accidents 2.2 Identify safety alarm	TLE_IAAUTO9-12PHSE-Ic-e-28

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> - Earthquake - Typhoon - Tsunami - Accidents - Sickness • Communicate ideas and information to reporting procedures • Techniques to document and report numbers for emergency procedures • Accident details documentations • Evacuation plan • Worksite evacuation procedures • Qualified person to be contacted in case of accident or sickness 			2.3 Contact qualified persons in the event of accident or sickness of customers or staff, and document accident details according to worksite procedures 2.4 Identify worksite evacuation procedures	
LESSON 10: INSPECTING TECHNICAL QUALITY OF WORK (ITQ)				
<ul style="list-style-type: none"> • OH&S regulations/ requirements, equipment, material and personal safety requirements • Quality systems in a workplace • Common automotive inspection method • Vehicle manual of specifications • Technical data calibration requirement for automotive 	The learners demonstrate an understanding of concepts and underlying principles of inspecting technical quality of work	The learners shall be able to inspect technical quality of work	LO 1. Gather information to carry out inspection 1.1 Observe OHS requirements, including company regulatory requirements and personal protection needs, throughout the work 1.2 Source pertinent information 1.3 Analyze different methods appropriate to the circumstances 1.4 Identify technical and/or calibration requirements for inspection	TLE_IAAUTO9-12ITQ-If-29
<ul style="list-style-type: none"> • Work planning process • Company quality systems and procedures 			LO 2. Inspect and apply quality standards to work 2.1 Identify work for inspection in accordance with company quality procedures	TLE_IAAUTO9-12ITQ-Ig-i-30

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> • Worksite environmental control measures • Vehicle safety requirements • Quality inspection procedure • Quality standards • Coordinating work activity • Work quality documentation 			2.2 Conduct quality inspections throughout the course of the work to ensure that quality standards are maintained 2.3 Apply quality standards during work completion to ensure customer’s satisfaction based on industry and / or company policies and guidelines 2.4 Coordinate activities throughout the workplace in accordance with company procedures 2.5 Maintain documents of work quality according to company requirements	
<ul style="list-style-type: none"> • Quality system in the workplace • Communication skills 			LO 3. Achieve quality work outcomes. 3.1 Avoid damage to customer property by ensuring staff adherence to quality procedures and use of protective materials at all stages of repair or service 3.2 Create excellent communication procedures pertaining to quality improvements and recommendations in accordance with company requirements	TLE_IAAUTO9-12ITQ-Ij-31
LESSON 11: MAINTAINING QUALITY SYSTEM (MQS)				
<ul style="list-style-type: none"> • Quality system procedures and needs • Shop performance indicators • Quality systems application techniques in work environment • Workshop documentation on process and work outcomes • Employee performance feedback system 	The learners demonstrate an understanding of concepts and underlying principles of maintaining quality system	The learners shall be able to maintain quality system	LO 1. Conduct final quality checks on completed work/order 1.1 Check completed work / orders for compliance with supplier, company, or customer specifications 1.2 Conduct level of inspection appropriate to the size and importance of the job 1.3 Authorize documentation in accordance with company requirements 1.4 Provide feedback to staff on the quality of their work, with equal emphasis on strengths and weaknesses and opportunities for development	TLE_IAAUTO9-12MQS-IIa-c-32

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> • Worksite information management system • Enterprise quality system and procedures • Workers performance indicators 			<p>LO 2. Report on the quality of processes and work outcome</p> <p>2.1 Keep documents according to company quality procedures on outcomes of quality checks</p> <p>2.2 Identify quality problems that are in accordance to company performance indicators</p> <p>2.3 Provide information relating to the quality of processes and work outcomes appropriate to persons on a regular basis</p>	<p>TLE_IAAUTO9-12MQS-IIId-33</p>
<ul style="list-style-type: none"> • Methods of generating inputs relevant to solving problem • OHS requirement, equipment, material, and personal safety requirements • Research and interpretive skills to locate, interpret, and apply quality audit policies and procedures • Effective shop communication skills • Leadership skills in organizing, implementing, and promoting worksite quality systems and measures • Quality procedure 			<p>LO 3. Implement improvement to work processes.</p> <p>3.1 Encourage staff input to generate possible solutions to quality problems</p> <p>3.2 Generate options for solving quality problems and evaluate costs and benefits of each option</p> <p>3.3 Discuss recommended solutions to quality problems with management</p> <p>3.4 Implement improvements to work processes according to company policies and procedures</p>	<p>TLE_IAAUTO9-12MQS-IIe-34</p>
LESSON 12: IDENTIFYING AND SELECTING ORIGINAL AUTOMOTIVE PARTS AND PRODUCTS (ISOA)				
<ul style="list-style-type: none"> • Manufacturer/component supplier specifications and technical documentation • Company procedures and documentation 	<p>The learners demonstrate an understanding of concepts and underlying principles of identifying and selecting</p>	<p>The learners shall be able to select automotive parts and products</p>	<p>LO 1. Identify the part/product and its end use</p> <p>1.1 Gather available part/product information and confirm with customer all available parts/product</p>	<p>TLE_IAAUTO9-12ISOA-IIIf-g-35</p>

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> • Company or industry specifications, diagrams, sketches • Product information gathering method • Verbal descriptions and physical and visual evidence • Brochures and catalogues presentations 	original automotive parts and products		1.2 Establish information gathering techniques for proper identification of part/product 1.3 Establish end-user or host for the part/product, i.e., vehicle/unit assembly or vehicle/unit assembly options from an analysis of available information	
<ul style="list-style-type: none"> • Parts/Product catalogue system, both brand-specific and general options • Company quality system • Legal issues associated with the supply and use of nonconforming parts, components, and accessories • Interpreting parts book 			LO 2. Identify details of the part/product 2.1 Access parts/product cataloguing system 2.2 Match accurately part/product with cataloguing information by accessing and using the catalogue system 2.3 Document details of identity of the part/product	TLE_IAAUTO9-12ISOA-IIh-36
<ul style="list-style-type: none"> • Communication skills in dealing with customers • Identifying equipment and selecting automotive parts and products • Workplace technology related to customer services 			LO 3. Part/product is supplied or ordered for customers 3.1 Customer accepts process used 3.2 Order part/product for customers 3.3 Update customer records	TLE_IAAUTO9-12ISOA-III-37
<ul style="list-style-type: none"> • Effective feedback system • Records management system 			LO 4. Review personal training performance and finalize documentation 4.1 Reflect upon personal performance in providing instruction and demonstration, and document strategies for improvement 4.2 Store learner records according to organizational and legal requirements	TLE_IAAUTO9-12ISOA-IIj-38

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
CORE COMPETENCIES				
Introduction 1. Relevance of the course 2. Core concepts in automotive servicing 3. Employment opportunities 4. Business opportunities 5. Further studies	The learners demonstrate an understanding of the basic concepts and underlying theories in automotive servicing.	The learners shall be able to perform engine and body electrical services as prescribed by TESDA Training Regulations	1. Explain basic concepts in automotive servicing 2. Discuss relevance of the course 3. Explore opportunities for employment, business, or further studies	
LESSON 13: PERFORMING GAS ENGINE TUNE UP (PGET)				
<ul style="list-style-type: none"> • Spark plug and its function • Procedure in adjusting spark-plug clearance • Procedure in testing spark plug • Analyzing spark-plug spark • Safety procedure in servicing spark plugs • Timing result/reference table 			LO 1. Inspect/test spark plug 1.1 Adjust spark-plug clearance 1.2 Test spark plug 1.3 Analyze spark-plug test result and prescribe appropriate recommendations	TLE_IAAUTO9-12PGET-IIIa-b-39
<ul style="list-style-type: none"> • Fuel filter and its function • Air cleaner and its uses • Procedure in replacing fuel filter and air cleaner • Types of filter elements • Cleaning fuel filter 			LO 2. Check/replace fuel filter and air cleaner 2.1 Replace fuel filter and air cleaner 2.2 Free fuel filter from sediments and impurities	TLE_IAAUTO9-12PGET-IIIc-40
<ul style="list-style-type: none"> • Parts of ignition system • Function of contact point • Function of condenser • Procedure in inspecting/adjusting/replacing contact point gap • Procedure in testing and replacing condenser 	The learners demonstrate an understanding of gas engine tune-up	The learners shall be able to perform a gas engine tune-up	LO 3. Inspect/Replace Contact Point Condenser 3.1 Inspect contact point gap 3.2 Test and replace condenser	TLE_IAAUTO9-12PGET-IIIId-e-41

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> • Function of distributor • Procedure in adjusting dwell angle • Setting ignition timing 			LO 4. Test/ adjust dwell angle and ignition setting 4.1 Adjust dwell angle 4.2 Set ignition timing	TLE_IAAUTO9-12PGET-IIIi-f-i-42
<ul style="list-style-type: none"> • Parts and function of carburetor • Procedure in adjusting idle engine speed • Adjusting idle fuel mixture • Checking engine revolutions per minute (RPM) 			LO 5. Adjust engine idle speed and mixture 5.1 Check engine speed in RPM	TLE_IAAUTO9-12PGET-IIIj-43
<ul style="list-style-type: none"> • Procedure in adjusting ignition timing • Procedure in checking advance timing • Safety precautions in working with ignition system 			LO 6. Check advance mechanism and adjust ignition timing 6.1 Adjust ignition timing 6.2 Observe safety in using equipment 6.3 Check advanced timing	TLE_IAAUTO9-12PGET-IVa-e-44
<ul style="list-style-type: none"> • Engine compression requirement • Procedure in compression testing • Safety precaution • Compression specification 			LO 7. Perform compression testing 7.1 Conduct compression test 7.2 Conduct test without damage or injury to person or property 7.3 Interpret compression test result and prescribe recommendations	TLE_IAAUTO9-12PGET-IVf-j-45

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
LESSON 14: PERFORMING DIESEL ENGINE TUNE UP (PDET)				
<ul style="list-style-type: none"> • Diesel engine parts and components • Parts and function of injection pump • Procedure in installing injection pump • Fuel injection timing marks location interpretation and application • Use of special service tool (SST) in installing injection pump • Positive work values • Type and classification of gasket and sealant • Safe work practices 	The learners demonstrate an understanding of diesel engine tune-up	The learners shall be able to perform a diesel engine tune-up	LO 1. Set injection timing 1.1 Position injection parts as required in setting injection timing 1.2 No error in detecting/reading injection pump timing 1.3 Recheck injection timing setting by following instructional manual	TLE_IAAUTO9-12PDET-Ia-c-46
<ul style="list-style-type: none"> • Procedure installing injection pump. • Use of SST in installing injection pump 			LO 2. Install injection pump 2.1 Check timing marks, torque and injection pump moving parts before installation 2.2 Set up injection pump requirement before installation 2.3 Tighten mounting bolts following torque sequence, pattern, and specification in the manual	TLE_IAAUTO9-12PDET-Id-h-47
<ul style="list-style-type: none"> • Procedure in injection timing • Timing marks interpretation and application • Fuel injection marks • Timing result/reference table 			LO 3. Inspect injection timing 3.1 Use injection pump timing device without error 3.2 Interpret injection pump timing result correctly 3.3 Check advance timing operation	TLE_IAAUTO9-12PDET-Ih-j-IIa-48

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> • Reasons for bleeding injection system components • Parts and function of injection system components • Procedure in bleeding injection pump • Handling of bleeder screw and pump • Handling of equipment such as tester and pressurized gases • Positive work values • Safe working practices 			<p>LO 4. Bleed injection system Components</p> <p>4.1 Check fuel level, line leakage, and fuel strainer or filters</p> <p>4.2 Determine air lock in the system without error</p> <p>4.3 Identify bleeder screw and prime pump without error</p>	<p>TLE_IAAUTO9-12PDET-IIa-e-49</p>
<ul style="list-style-type: none"> • Compression requirements of diesel engine • Procedure in compression testing • Use of compression testing instruments • Use of special service tools • Positive work values • Effects of low compression 			<p>LO 5. Conduct compression testing</p> <p>5.1 Set up engine requirements in compression testing</p> <p>5.2 Read and interpret specific compression test result</p> <p>5.3 Give corresponding recommendation/prescription based on test result</p>	<p>TLE_IAAUTO9-12PDET-IIIf-j-50</p>
LESSON 15: REMOVING AND REPLACING ELECTRICAL/ELECTRONICS UNITS/ASSEMBLIES (RREE)				
<ul style="list-style-type: none"> • OHS –interpreting work instruction regulations/requirements, equipment, material, and personal safety requirements • Types, applications and external specifications of electrical/electronic units/assemblies 	<p>The learners demonstrate an understanding of concepts and underlying principles of removing and replacing electrical/electronic units/assemblies</p>	<p>The learners shall be able to remove and replace electrical/electronic units/assemblies</p>	<p>LO 1. Prepare for work</p> <p>1.1 Use work instruction to determine job requirements, including method, material, and equipment</p> <p>1.2 Read and interpret job specifications</p> <p>1.3 Observe OHS requirements throughout the work</p> <p>1.4 Select material for work appropriate to application</p>	<p>TLE_IAAUTO9-12RREE-IIIa-51</p>

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> • Use of tooling and equipment • Type of materials tools and equipment • Materials economy 			1.5 Identify equipment and tooling for safe and effective operation 1.6 Check equipment and tooling for safe and effective operation 1.7 Determine procedures to minimize waste material and to maximize energy efficiency	
<ul style="list-style-type: none"> • Electrical / electronic units / assemblies • Removal procedures for electrical /electronic units/ assemblies • Material relevant to removal and of electrical and electronic units/assemblies • Specifications and work instructions • Equipment, hand, and power tooling appropriate to removal of electrical / electronic units / assemblies • Procedures in removing electrical and electronic units and assemblies • Safe handling of electrical/ electronic units/assemblies • Procedures in working with air-conditioning units, liquefied petroleum gas, compressed natural gas, and similar technologies 			LO 2 Remove electrical /electronic units assemblies 2.1 Access correct information from manufacturer/component supplier specifications 2.2 Interpret correct information from manufacturer/component supplier specifications 2.3 Remove electrical / electronic units / assemblies using approved methods, tooling, and equipment 2.4 Seek assistance from a licensed person in relation to air conditioning and LPG/NGV system/ components removal 2.5 Complete the removal without causing damage to component or system 2.6 Carry out removal activities according to company procedures/policies 2.7 Handled units/assemblies in accordance with manufacturer/component supplier requirements 2.8 Store units/assemblies in accordance with manufacturer/component supplier requirements	TLE_IAAUTO9-12RREE-III b-g-52

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> • Replacement procedures for electrical/electronic units/assemblies • Material relevant to replacement of electrical and electronic units/assemblies • Equipment, hand, and power tooling appropriate to replacement of electrical / electronic units / assemblies • Procedures in working with air-conditioning units, liquefied petroleum gas, and compressed natural gas components 			<p>LO 3. Replace electrical/electronic units/assemblies</p> <p>3.1 Replace electrical units/assemblies using approved methods, tooling and equipment</p> <p>3.2 Seek assistance from a licensed person in relation to air conditioning and LPG/NGV system/ components removal</p> <p>3.3 Complete the replacement without causing damage to component or system</p> <p>3.4 Carry out replacement activities in accordance with company procedures/policies</p>	<p>TLE_IAAUTO9-12RREE-IIIh-i-53</p>
<ul style="list-style-type: none"> • Environmental-conservation procedures, e.g., 3R (reduce, reuse, recycle) • Company quality processes • Quality procedures, e.g., 5S • Safe handling of tools and consumables • Maintaining safe working area 			<p>LO 4. Clean up work area and maintain equipment</p> <p>4.1 Collect and store materials that can be reused</p> <p>4.2 Removed waste and scrap following workplace and environmental procedures</p> <p>4.3 Clean equipment and work area for serviceable condition in accordance with workplace procedures</p> <p>4.4 Clean and inspect equipment and work area for serviceable condition in accordance with workplace procedures</p> <p>4.5 Complete operator maintenance in accordance with manufacturer/component supplier specifications and site procedures</p> <p>4.6 Maintain tooling in accordance with workplace procedures</p>	<p>TLE_IAAUTO9-12RREE-IIIj-54</p>

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
LESSON 16 : REMOVING AND TAGGING ENGINE SYSTEM COMPONENTS (RTES)				
<ul style="list-style-type: none"> • Engine system terminology and function of each component • Plan work activities • Removal procedures • OHS regulations/requirements, equipment, material, and personal safety requirements • Work procedures and specifications • Methods and options available in performing the job/work • Safety practices 	The learners demonstrate an understanding of concepts and underlying principles of removing and tagging engine system components	The learners shall be able to remove and tag engine system components	LO 1. Prepare to remove and tag engine system components 1.1 Identify and confirm the nature and scope of work requirements 1.2 Observe OHS requirements, including individual national / local / territorial regulatory requirements and personal protection needs throughout the work 1.3 Source out procedures and information such as workshop manuals and specifications, and required tools and equipment 1.4 Analyze method options and ensure that those most appropriate to the circumstances are selected and prepared 1.5 Observe dangers associated with working on the removal and tagging of engine components	TLE_IAAUTO9-12RTES-IVa-e-55
<ul style="list-style-type: none"> • Engine system components • Methods for the removal and tagging • Inspection of components • Relationship of components to each other • Documenting work activities 			LO 2. Remove engine system components 2.1 Identify engine system components 2.2 Implement methods for the removal and tagging in accordance with manufacturer / component supplier specifications 2.3 Remove components without damage 2.4 Carry out inspection of components 2.5 Process report in accordance with workplace procedures on communication	TLE_IAAUTO9-12RTES-IVf-j-Ia-e-56
<ul style="list-style-type: none"> • Tagging procedures • Tagging materials • Quality procedures, e.g., 5S • Support equipment for tagging • Safety procedures 			LO 3. Tag engine system components 3.1 Identify tagging procedures 3.2 Identify material requirements for tagging and prepare support equipment 3.3 Tag components without damage	TLE_IAAUTO9-12RTES-If-j-57

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
LESSON 17: REMOVING AND TAGGING STEERING, SUSPENSION AND BRAKE SYSTEM COMPONENTS (RSSB)				
<ul style="list-style-type: none"> • OHS requirements • PPE • Workshop manuals • Parts catalogue • Customer orders and industry/workplace codes of practice • Company operating procedures • Tagging procedures • Methods in removing tag <ul style="list-style-type: none"> - -steering system - -suspension system - -brake system • Safe work practices 	<p>The learners demonstrate an understanding of concepts and underlying principles of removing and tagging steering, suspension, and brake system</p>	<p>remove and tag steering, suspension, and brake system</p>	<p>LO 1. Prepare to remove and tag steering, suspension, and brake system components</p> <ol style="list-style-type: none"> 1.1 Identify and confirm the nature and scope of work requirements 1.2 Observe OHS requirements, including individual national / local / territorial regulatory requirements and personal protection needs 1.3 Sources of procedures and information such as workshop manuals and specifications, and required tools and equipment 1.4 Selects methods and techniques most appropriate to the circumstances 1.5 Observe dangers associated working with the removal and tagging of steering, suspension, and brake system components 	<p>TLE_IAAUTO9-12RSSB-IIa-f-58</p>
<ul style="list-style-type: none"> • Steering system <ul style="list-style-type: none"> - Types - Parts - Power steering • Brake system <ul style="list-style-type: none"> - Types - Parts • Suspension system <ul style="list-style-type: none"> - Types - Parts • Macpherson • Double wishbone • Material safety data sheets • Safe work procedures related to removing and tagging engine system components • Parts catalogues • Materials safely data sheets 			<p>LO 2.Remove steering, suspension and brake system components.</p> <ol style="list-style-type: none"> 2.1 Identify steering, suspension, and brake system components for removal 2.2 Implement methods for the removal and tagging in accordance with manufacturer / component supplier specifications 2.3 Remove components without damage 2.4 Carry out inspection of components i 2.5 Process report in accordance with workplace procedures on communication 	<p>TLE_IAAUTO9-12RSSB-IIg-j-IIIa-f-59</p>

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> • 5S • Company operating procedures for tagging components • Methods for tagging steering, suspension, and brake system 			<p>LO 3. Tag steering, suspension, and brake system components</p> <p>3.1 Identify tagging procedures</p> <p>3.2 Identify material requirements for tagging and prepare support equipment</p> <p>3.3 Tag components without damage</p>	<p>TLE_IAAUTO9-12RSSB-IIIg-j-60</p>
LESSON 18: REMOVING AND TAGGING TRANSMISSION SYSTEM COMPONENTS (RTTS)				
<ul style="list-style-type: none"> • Types of transmission • OHS requirements • PPE • Workshop manuals • Parts catalogue • Customer orders and industry/workplace codes of practice • Company operating procedures • Tagging procedures • Methods of removing transmission 	<p>The learners demonstrate an understanding of concepts and underlying principles of removing and tagging transmission system components</p>	<p>The learners shall be able to remove and tag transmission system components</p>	<p>LO 1. Prepare to remove and tag transmission components</p> <p>1.1 Identify and confirm nature and scope of work requirements</p> <p>1.2 Observe OHS requirements, including individual national / local / territorial regulatory requirements and personal protection needs</p> <p>1.3 Sources of procedures and information such as workshop manuals and specifications, and required tools and equipment</p> <p>1.4 Select method and techniques most appropriate to the circumstances</p> <p>1.5 Be aware of dangers associated working with the removal and tagging of transmission components</p>	<p>TLE_IAAUTO9-12RTTS-IVa-c-61</p>
<ul style="list-style-type: none"> • Manual transmission system types, parts • Automatic transmission types and parts • Drivelines components • Rear axle/final drive • Material safety data sheets 			<p>LO 2. Remove transmission system components</p> <p>2.1 Identify transmission components for removal</p> <p>2.2 Implement methods for the removal and tagging in accordance with manufacturer / component supplier specifications</p> <p>2.3 Remove components without damage</p> <p>2.4 Carry out inspection of components</p>	<p>TLE_IAAUTO9-12RTTS-IVd-i-62</p>

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<ul style="list-style-type: none"> • Safe work procedures related to removing and tagging engine system components • Parts catalogues • Inspecting transmission components • Procedures in removing transmission 			2.5 Process report in accordance with workplace procedures on communication	
<ul style="list-style-type: none"> • 5S • Company operating procedures for tagging components • Safe working practices 			LO 3.Tag transmission components 3.1 Identify tagging procedures 3.2 Identify material requirements for tagging and prepare support equipment 3.3 Tag components without damage	TLE_IAAUTO9-12RTTS-IVj-63

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TOOLS	RESOURCES		LEARNING MATERIALS	COURSE DELIVERY
	EQUIPMENT	MATERIALS		
<ul style="list-style-type: none"> • Box wrench • Socket wrench • Pliers • Screw driver • Wire stripper • Mechanic’s hammer • Apron • Goggle • Gloves • Torque wrench • Feeler gauge • Battery tester • Hydrometer • Dial gauge • Bore gauge • Micrometer caliper • Jump starter cable • Air impact tools • Coil spring compressor • Belt tension gauge • Steel rule • Pull push rule • Grease gun • Oiler • Thermostat pressure gauge • Oil filter wrench • Fender cover • Nozzle tester • Transmission jack • Floor jack • Car lift • Pullers • Rubber mallet • Clutch-aligning tool • Snap ring pliers • Vehicle stand support 	<ul style="list-style-type: none"> • Hydraulic jack/lift • Running condition vehicle • Growler tester • Ignition timing light • Tachometer • Wheel balancer • Wheel aligning equipment • Air compressor • Wash rack • Multimeter • Vehicle 	<ul style="list-style-type: none"> • Grease • Engine oil • Sealant/adhesive • Hydraulic oils/gear oil • Automatic transmission fluid • Wheel wedges • Test lamp • PPE • Solvent • Sand paper • Brake fluid • Coolant • Power steering fluid • Rugs • Tool rack • Battery • Electrical Tape • Oil filter • Grease 	<ul style="list-style-type: none"> • Modules • Brochures • Catalogues • API manual • Handouts • Learning guides • Occupational Health and Safety rules • Power point presentations • Manufacturer’s specification • Repair manual • Motor Vehicle • Multimeter (digital) • Battery • Gasoline engine mockup • Diesel engine mockup • Starting System mockup • Charging system mockup • Model parts of cooling system • Maintenance manual • Inventory of tools and materials • Writing materials • Reference books • Computers • CDs, tapes, transparency • Company policies and standards • Clean Air Act • Waste management • Disaster preparedness and management • Electrical and fire safety codes • Record book • OHS personal records • Labeling materials 	<ul style="list-style-type: none"> • Modular • Demonstration • Lecture • Discussion • Dual training • Distance learning • Group work • Interaction • Role playing • Symposium • Group dynamics • Film viewing <p>Assessment Method</p> <ul style="list-style-type: none"> • Written examination • Demonstration • Practical test • Direct observation • Interview • Case study • Simulation • Portfolio assessment • Situation analysis

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GLOSSARY

1. Light-duty vehicles - Motor vehicles whose gross vehicle weight is equal to or less than 3,500 kgs, and powered by a gas or diesel engine
2. Automotive service technician - All-around auto serviceman that can perform both mechanical and electrical as well as auto electronics maintenance checking and inspection of motor vehicle; assesses vehicle problems, perform all necessary diagnostic test or installation of accessories, and competently repairs or replaces faulty parts
3. Adhesive - Substance used to hold gasket in place during assembly; also maintains a tight seal by filling in small irregularities on a surface and prevents gasket from shifting due to vibration
4. Anti-lock braking system - System that automatically controls wheel slip or prevents sustained wheel locking on braking
5. Automatic transmission - A transmission in which gear or ratio changes are self-activated, eliminating the necessity of hand shifting gears
6. Backlash - Amount of clearance or play between two meshed gears
7. Catalytic converter - Control device fitted in the exhaust system of an internal combustion engine; the converter reduces the toxicity of products of combustion by catalytic recombination
8. Charcoal canister - Trap containing charcoal granules to store fuel evaporating from a fuel system and prevent its loss to atmosphere, particularly from a carburetor and fuel tank
9. Electronics - Electrical assemblies, circuit, and system that use electronic devices such as transistors and diodes
10. Emissions - Any air contaminant, pollutant, or gas stream from a known source which is introduced into the atmosphere
11. Final drive - The end of the drive train before power is transmitted to the wheels
12. Fuel Injection - An electronic system that increases the performance and fuel economy because it monitors engine conditions and provides the correct air/fuel mixture based on the engine's demand. It injects fuel directly into the cylinder head enabling more precise control over the quantity used.
13. Governor - A speed sensing device that employs centrifugal force and spring tension to govern engine speed
14. Hotchkiss drive - Type of rear suspension in which leaf springs absorbs the rear axle housing torque
15. Intake manifold - Tubing attached to the engine through which the air/fuel mixture reaches the cylinder
16. Ignition system - Electrical system devised to produce timed sparks from engine spark plug, consisting of a battery, induction coil, capacitor, distributor, spark plugs, and relevant switches and wiring
17. Master cylinder - Liquid-filled cylinder in the hydraulic brake system or clutch, in which hydraulic pressure is developed when one depresses a foot pedal
18. Periodic maintenance service - Regular servicing prescribed by manufacturer to maintain the vehicle's top performance
19. Positive crank ventilation - Emission control system that prevents crank case gases from entering the atmosphere, usually by drawing the gases from the crank case and feeding them into the engine's induction system
20. Power steering - Steering that has been designed to make the wheel move more easily than in a manual steering system. Hydraulic assists the process utilizing hydraulic fluid. The fluid increases pressure in the power steering pump and aids in the movement of the steering mechanism. This fluid, called power steering fluid, is what is replaced at regular intervals to keep steering soft and comfortable.
21. Supercharged engine - An engine that is similar to a turbocharged engine, which uses a series of belts or chains from the crankshaft to turn the turbines that forces the air/fuel mixture into the cylinder heads under pressure creating a bigger explosion which generates more power. A turbocharger uses the exhaust gases to turn the turbines to create the same effect.
22. Transaxle - Type of construction in which the transmission and differential are combined in one unit

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- | | | | |
|----|---------------------|---|---|
| 23 | Thermostat | - | A device for automatic regulation of temperature |
| 24 | Turbocharged engine | - | A performance-increasing turbine positioned in the exhaust system; expanding exhaust gases spin an impeller (very small fan-type blades) at speeds of up to 25 thousand rpm, driving a similar compressing impeller. Compressed air from the driven impeller is forced into the induction system, which squeezes more air/fuel mixture into the combustion chambers. With the greater charge of air and fuel, a more powerful combustion burn results, and hence more power. The big advantage of the turbo over directly driven superchargers is the increased efficiency, although there is a slight lag before the turbine spins up and increases the power output. Originally, turbos were developed to enable aircraft to fly at high altitudes; they later found use in diesel trucks and train engines to increase torque. |
| 25 | U-joint | - | A four-joint cross-connected to two U-shaped yokes that serve as a flexible coupling between shafts |

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CODE BOOK LEGEND
Sample: **TLE_IAAUTO9-12AAS-Ia-1**

LEGEND		SAMPLE		DOMAIN / COMPONENT	CODE
First Entry	Learning Area and Strand	Technology and Livelihood Education	TLE_	Common Competencies	
	Subject or Specialization	Industrial Arts	IA	Applying Appropriate Sealant/Adhesive	AAS
	Grade Level	Automotive Servicing NC I	AUTO	Moving and Positioning Vehicle	MPV
Uppercase Letter/s	Domain/Content/Component/ Topic	Applying Appropriate Sealant/Adhesive	AAS	Performing Measurement and Calculation	PMC
				Reading, Interpreting, and Applying Specification and Manual	RIA
				Using and Applying Lubricant/Coolant	UAL
Roman Numeral *Zero if no specific Quarter	Quarter	First Quarter	I	Performing Shop Maintenance	PSM
Lower case letter/s *put a an en dash (-) between letters to indicate more than a specific week	Week	Week one	a	Preparing Job Estimate/Costing	PJE
				Interpreting/Drawing Technical Drawing	ITD
				Practicing Health, Safety, and Environment Procedures	PHSE
				Inspecting Technical Quality of Work	ITQ
				Maintaining Quality System	MQS
				Identifying and Selecting Original Automotive Parts and Products	ISOA
				Core Competencies	
				Performing Gas Engine Tune Up	PGET
				Performing Diesel Engine Tune Up	PDET
Arabic Number	Learning Outcome	Identify appropriate sealant/adhesive	1	Removing and Replacing Electrical/Electronics Units/Assemblies	RREE
				Removing and Tagging Engine System Components	RTES
				Removing and Tagging Steering, Suspension and Brake System Components	RSSB
				Removing and Tagging Transmission System Components	RTTS

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 Automotive Servicing NC I*. Taguig City, Philippines: TESDA, 2011.