

## Rajasthan Skill & Livelihoods Development Corporation

<b>1. Module Name</b>	<b>Two Wheeler Mechanic</b>
<b>2. Sector</b>	Automotive Repair
<b>3. Entry Qualification</b>	Minimum 5 <sup>th</sup> Pass
<b>4. Minimum Age (in years)</b>	15
<b>5. Duration</b>	<b>59 days/ 354 hrs.</b>
<b>6. Provision of Tool kit</b>	Yes
<b>7. Terminal Competency</b>	<p>After completion of the course the trainee will be able to:</p> <ul style="list-style-type: none"> <li>• identify, use, maintain and store – general tools, special tools and equipments;</li> <li>• observe safety precautions in handling tools and equipments;</li> <li>• identify and use various fasteners;</li> <li>• identify vehicle components;</li> <li>• handle fuels, oils, lubricants, fire extinguishers carefully;</li> <li>• carry out minor repairs and overhauling of two wheelers (motorcycles and scooters);</li> <li>• dismantle, clean, check, repair and assemble engine components of different models;</li> <li>• dismantle, clean and refit silencer;</li> <li>• dismantle, clean, reset, fit &amp; fine tune carburettor;</li> <li>• drain and replace engine oil;</li> <li>• dismantle, clean, check, repair and refit clutch &amp; gear box;</li> <li>• dismantle, clean, check, repair and reassemble brake assembly;</li> <li>• overhaul disc &amp; drum brakes systems;</li> <li>• adjust steering play and shock absorbers;</li> <li>• check voltage, resistance, continuity and find fault in electrical circuits &amp; rectify;</li> <li>• check and overhaul starter motor and starting system;</li> <li>• undertake repairing of punctured tube and undertake plugging of puncture in tubeless tyre;</li> <li>• wash a vehicle while observing safety points; and</li> <li>• carry out fine tuning, test, rectify the vehicle;</li> </ul>

	<b>Approx. hrs.</b>
<b>8. Registration, Inauguration, introduction and objectives of the course</b>	2

<b>9. Course content</b>			
	<b>Approx. hrs.</b>	<b>Under pinning Knowledge (theory)</b>	<b>Approx. hrs.</b>
<p><b>BASICS</b></p> <ul style="list-style-type: none"> <li>• Reading and understanding of service manual</li> <li>• Familiarization with Vehicle identification(VIN)</li> <li>• Practice on different types of fastening devices</li> <li>• Practice 5S techniques</li> <li>• Handling of fire extinguishers</li> <li>• Practice on different types of hand tools</li> </ul>	12	<ul style="list-style-type: none"> <li>• General service information</li> <li>• General safety</li> <li>• Handling of two wheeler components</li> <li>• Handling of fuels</li> <li>• Types of fasteners</li> <li>• Effects of exhaust smoke</li> <li>• Fire extinguishers</li> <li>• Threads and its types</li> <li>• Reading and Understanding service manuals</li> </ul>	6

<ul style="list-style-type: none"> <li>• Handling of workshop equipments</li> </ul>		<ul style="list-style-type: none"> <li>• Over view on 5S technique (Sort, Set in order, Shine/Sweep, Standardize &amp; Sustain) – advantages in implementation of 5S</li> <li>• Handling and Disposal of consumables</li> <li>• Hand tools-types-description</li> <li>• Study about various workshop equipments</li> <li>• Using sand paper - grades of sand paper</li> </ul>	
<p><b>ENGINE – Dismantling and assembling of the engine parts</b></p> <ul style="list-style-type: none"> <li>• Checking engine compression</li> <li>• Checking engine vacuum</li> <li>• Removing timing chain</li> <li>• Dismantling cylinder head</li> <li>• Decarbonizing</li> <li>• Testing valve, valve seat and valve guide</li> <li>• Reassembling cylinder head</li> <li>• Adjusting valve clearance</li> </ul>	60	<ul style="list-style-type: none"> <li>• 4s &amp; 2s engines</li> <li>• Petrol engines - principle</li> <li>• Effects of engine compression</li> <li>• Effects of engine vacuum</li> <li>• Constructional details of valve mechanism</li> <li>• Importance of correct valve clearance</li> <li>• Types of cylinder head</li> <li>• Effects of carbon deposits in the cylinder</li> <li>• Precautions to be taken while decarbonizing</li> <li>• Using torque wrenches</li> </ul>	8
<p><b>EXHAUST SYSTEM</b></p> <ul style="list-style-type: none"> <li>• Testing exhaust smoke</li> <li>• Cleaning secondary air injection system</li> <li>• Silencer cleaning in 2 stroke engine vehicles</li> </ul>	18	<ul style="list-style-type: none"> <li>• Emissions of exhaust smoke and its effects</li> <li>• Principle of secondary air injection system</li> <li>• Importance of clean silencer</li> <li>• Principle of catalytic converter</li> </ul>	4
<p><b>FUEL SYSTEM</b></p> <ul style="list-style-type: none"> <li>• Cleaning fuel tank</li> <li>• Servicing air cleaner</li> <li>• Cleaning carburettor</li> <li>• Tuning carburettor</li> <li>• Changing fuel filters</li> </ul>	18	<ul style="list-style-type: none"> <li>• Description of fuel tank</li> <li>• Air cleaner – types - effects of clogged air cleaner</li> <li>• Carburettor principles – types - importance of carburettor adjustments - do's and don'ts while servicing carburetor</li> </ul>	4
<p><b>LUBRICATING SYSTEM</b></p> <ul style="list-style-type: none"> <li>• Draining and measuring engine oil level</li> <li>• Replacing/cleaning oil filter</li> <li>• Cleaning the engine with flushing oil</li> <li>• Replacing engine oil</li> </ul>	12	<ul style="list-style-type: none"> <li>• Lubricants – types - properties of lubricants</li> <li>• Lubrication system-lubricating circuit-functions of engine oil-engine oil grade-importance of correct quality and quantity of engine oil-troubles and causes for lubricating system</li> </ul>	4
<p><b>COOLING SYSTEM</b></p> <ul style="list-style-type: none"> <li>• Replacing coolant</li> <li>• cleaning radiator</li> <li>• Adjusting fan belt tension</li> </ul>	6	<ul style="list-style-type: none"> <li>• Cooling system-basic parts and its functions</li> <li>• Coolant – types - different coolant mixture ratios - troubles and causes in cooling system</li> </ul>	2
<p><b>TRANSMISSION</b></p> <ul style="list-style-type: none"> <li>• Adjusting clutch play</li> <li>• Removing chain and sprocket</li> <li>• Lubricating chain</li> <li>• Reassembling chain and sprocket</li> </ul>	24	<ul style="list-style-type: none"> <li>• Clutch – types - constructional details</li> <li>• Constructional details of Chain and sprocket</li> <li>• Details of variable transmission</li> </ul>	6

<ul style="list-style-type: none"> <li>• Servicing variable transmission</li> </ul>		<ul style="list-style-type: none"> <li>• assembly</li> <li>• Troubles and causes for transmission</li> </ul>	
<p><b>BRAKE SYSTEM</b></p> <ul style="list-style-type: none"> <li>• Dismantling the brake assembly</li> <li>• Inspecting brake drum, brake shoes and brake pads</li> <li>• Reassembling brake assembly</li> <li>• Replacing brake fluid</li> <li>• Bleeding the hydraulic brake system</li> <li>• Adjusting brake</li> </ul>	18	<ul style="list-style-type: none"> <li>• Brake – types – principle - constructional details</li> <li>• Brake fluid - types</li> <li>• Troubles and causes for brake system</li> <li>• Care to be taken while handling brake shoes</li> </ul>	6
<p><b>STEERING AND SUSPENSION SYSTEM</b></p> <ul style="list-style-type: none"> <li>• Adjusting steering play</li> <li>• Changing front fork oil</li> <li>• Adjusting shock absorbers</li> </ul>	12	<ul style="list-style-type: none"> <li>• Constructional details of steering-reasons for steering play</li> <li>• Effects of stiff steering</li> <li>• Description of front fork assembly</li> <li>• Shock absorbers – types – constructional details</li> </ul>	6
<p><b>ELECTRICAL</b></p> <ul style="list-style-type: none"> <li>• Practice on use of multimeter</li> <li>• Testing battery</li> <li>• Charging battery</li> <li>• Replacing the bulbs and fuses</li> <li>• Cleaning and adjusting spark plug gap</li> <li>• Aligning head lamp beam</li> <li>• Testing and tuning horn</li> <li>• Test relays</li> </ul>	24	<ul style="list-style-type: none"> <li>• Electrical basics</li> <li>• AC &amp; DC</li> <li>• Current, voltage &amp; resistance</li> <li>• Voltage drop</li> <li>• Wiring diagrams of ignition, lighting, starting and charging systems</li> <li>• Head lamp-description</li> <li>• Description of horn circuits</li> <li>• Purpose and functions of relay</li> <li>• Maintenance of battery - specification</li> </ul>	6
<p><b>ADJUSTING CABLE FREE PLAY AND LUBRICATION</b></p> <ul style="list-style-type: none"> <li>• Clutch cable free play adjustment</li> <li>• Front brake cable free play adjustment</li> <li>• Accelerator cable adjustment</li> </ul>	12	<ul style="list-style-type: none"> <li>• Reasons for providing cable free play</li> <li>• Different lubricating points</li> </ul>	3
<p><b>TYRE REPAIR WORK</b></p> <ul style="list-style-type: none"> <li>• Check inflation pressure and inflate properly</li> <li>• Measure tread depth and inspect for damage</li> <li>• Wheel truing</li> <li>• Repair tyre puncture &amp; tube</li> </ul>	12	<ul style="list-style-type: none"> <li>• Tyre designation(size)</li> <li>• Procedure for repairing the punctured tube</li> <li>• Description about the tyres-types-importance of correct inflation-tyre selection-troubles and causes</li> <li>• Factors affecting tyre life</li> </ul>	4
<p><b>WATER WASHING A VEHICLE</b></p>	12	<ul style="list-style-type: none"> <li>• Information regarding water wash</li> <li>• Safety points to be considered before water washing (masking the engine)</li> </ul>	3
		<b>Entrepreneurship &amp; Soft Skills and Computer Literacy Module:</b>	0
		<ul style="list-style-type: none"> <li>• Entrepreneurship – its necessity and charms of being an entrepreneur.</li> </ul>	1
		<ul style="list-style-type: none"> <li>• Who is an entrepreneur and characteristics of a successful Entrepreneur?</li> </ul>	2

		<ul style="list-style-type: none"> <li>• How to identify Business opportunities?</li> </ul>	2
		<ul style="list-style-type: none"> <li>• Steps for setting up a small scale venture.</li> </ul>	1
		<ul style="list-style-type: none"> <li>• Institutional support for entrepreneurship (whom to contact for what)</li> </ul>	2
		<ul style="list-style-type: none"> <li>• Government (Central/ State) Schemes and assistance from Banks/ other financial institutions</li> <li>- Procedures and formalities for getting loan.</li> </ul>	2
		<ul style="list-style-type: none"> <li>• How to prepare Business plan?</li> </ul>	2
		<ul style="list-style-type: none"> <li>• Financial literacy-Costing, Pricing, Profitability and Break Even Analysis.</li> </ul>	2
		<ul style="list-style-type: none"> <li>• Cash management in small enterprises.</li> </ul>	2
		<ul style="list-style-type: none"> <li>• Accounting and Book Keeping</li> </ul>	2
		<ul style="list-style-type: none"> <li>• Introduction to Taxation</li> </ul>	1
		<ul style="list-style-type: none"> <li>• Shop and Establishment Act and its provisions.</li> </ul>	1
		<ul style="list-style-type: none"> <li>• Creativity, Problem solving &amp; decision making.</li> </ul>	1
		<ul style="list-style-type: none"> <li>• Common mistakes generally made by entrepreneurs.</li> </ul>	1
		<ul style="list-style-type: none"> <li>• Interaction with successful entrepreneur and success stories.</li> </ul>	2
		<ul style="list-style-type: none"> <li>• Communication and Negotiation skills.</li> </ul>	1
		<ul style="list-style-type: none"> <li>• Interpersonal skills</li> </ul>	1
		<ul style="list-style-type: none"> <li>• How to Deal with customer attitude – Effective selling.</li> </ul>	1
		<ul style="list-style-type: none"> <li>• Marketing – Basic concepts/ Skills and effective mode of advertising.</li> </ul>	1
		<ul style="list-style-type: none"> <li>• Introduction to e-commerce.</li> </ul>	2
<b>Computer Fundamentals</b> <b>Customize the Desktop Environment e.g.</b> Desktop, Start Menu, and Taskbar etc. Configuring & Migrating Files, Folders & Settings - Folder Views, Accessibility Settings	2	<b>Computer Fundamentals, MS-Office &amp; Internet</b> introduction to Computers History of Computers Components of Hardware Peripherals	1
<b>MS Word</b> Creating, Organizing & Formatting Content Collaborating – Merge, Insert, View, Edit, Track Mode etc. Formatting & Managing Documents	4	<b>Concept of Operating System –</b> Windows XP, Exploring & Configuring the Windows XP Desktop Environment-Customize the Desktop, Start Menu, and Taskbar etc. Configuring & Migrating Files, Folders	1

<b>MS Excel</b> Creating, Analyzing & Formatting Data & Content Collaborating - Insert, View, Edit etc. Managing Workbooks	3	<b>Settings - Folder Views, Accessibility Settings</b> Features of Windows XP Understanding concepts of Word processing using MS-Word Understanding concepts of Electronic spreadsheet and various types of entries in it	1
<b>MS PowerPoint</b> Creating & Formatting Content Collaborating - Track, Edit, Add, Delete Comments, Merge Managing & Delivering Presentations	3		
<b>Internet Concepts</b> Opening websites and downloading data Writing, reading and sending emails	4	<b>Understanding concepts of URL</b> Creating and Opening an E-mail account. Receiving and sending emails Searching information on Internet.	1
<b>Approx. Total Practical hours</b>	<b>256</b>	<b>Approx. Total Theory hours</b>	<b>96</b>
<b>Grand Total (2+256+96)</b>			<b>354</b>

<b>10. Tools, Equipments and Material for a batch of 30 trainees</b>		
<b>S.No.</b>	<b>Item</b>	<b>Quantity</b>
	<b>General Tools Required for 30 trainees</b>	
1	Double ended spanner set 6-32 mm	06 sets
2	Ring spanner set 6-32 mm	06 sets
3	Tubular spanners 8,10,12,14,16,17 mm	06 nos. each
4	Socket spanners 6-32 mm with T bar and ratchet	06 sets
5	Allen keys 4-12 mm in steps of 2 mm	06 sets
6	Screw driver (flat) 20 cm x 9 mm blade	06 nos.
7	Screw driver (flat) 30 cm x 9 mm blade	06 nos.
8	Screw driver (Philips type) 100-300 mm set of 5 pieces	06 sets
9	Hammer ball peen 0.75 kg	06 nos.
10	Mallet hammer	06 nos.
11	Hammer rubber	06 nos.
12	Nose plier straight 15 cm	06 nos.
13	Combination plier 15 cm	06 nos.
14	Circlip plier external & contracting 6"	06 nos. each
15	Circlip plier external & contracting 7"	06 nos. each
16	Drift	06 nos.
17	Feeler gauge 20 blades metric	06 nos.
18	Adjustable spanner 20 cm	06 nos.
19	Spark plug spanner 12,14,17 mm	06 nos. each
20	File different shapes and size of 15 cm	06 sets
	<b>List of Tools, Equipment, Machineries and Vehicles</b>	
21	Water pump plier	01 no.
22	Torque wrench 0-50 NM	01 no.
23	Inspection lamp with guard	01 no.
24	Thread pitch gauge metric	01 no.
25	Oil can 0.5 liter capacity	01 no.
26	Centre punch 10 mm dia x 100mm	01 no.
27	Digital Tachometer able to measure up to 9999 RPM	01 no.
28	Compression gauge minimum up to 20 kg/cm <sup>2</sup> for petrol and 25 kg/cm <sup>2</sup> for diesel	01 no. each
29	Vacuum gauge	01 no.

30	Battery charger	01 no.
31	Digital Multi meter	01 no.
32	Hydrometer	01 no.
33	Battery load tester	01 no.
34	Engine valve removing tool(C clamp)	01 no.
35	Tappet adjuster	01 no.
36	Air compressor 200 liters capacity	01 no.
37	Impact screw driver for flat and Philips type	01 set
38	Pneumatic tyre inflator	01 no.
39	Greasilator	01 no.
40	Pneumatic tools (connected with air compressor by pipe fittings)	01 set
41	Universal clamp wrench	01 no.
42	Clutch puller for available vehicles	01 no. each
43	Magneto puller for available vehicles	01 no. each
44	Cleaning tray 45 x 30 cm	15 nos.
45	Work benches each 250 x 120 x 60 with 4 bench vices 12 cm jaw	01 set
46	Spark plug cleaning and testing machine	01 no.
47	Bench grinder	01 no.
48	Washing facility	01 no.
49	Timing light	01 no.
50	Vacuum cleaner	01 no.
51	Fire extinguisher	01 no.
52	Steel tool box with lock and key (folding type) 400 x 200 x 150 mm size	06 boxes
53	Steel Almira minimum 6' height	04 nos.
54	Scooter 4 stroke variable transmission type 100-125 cc with service manual	02 nos.
55	Bike 4 stroke electric start up to 100cc with service manual	01 no.
56	Bike 4 stroke electric start with ABS up to 150cc with service manual 01 no	01 no.
57	Bike 4 stroke water cooled up to 150cc with service manual	01 no.

**Note: The Training partner will conduct two days of exposure visit of trainees in a two wheeler workshop of any local authorized agent for live exposure of various latest & modern machineries used in repair and service of two wheelers.**

S.No.	Item	Quantity	S.No.	Item	Quantity
	<b>Hardware</b>			<b>Software:</b>	
1	Computers/Laptops	10 (one for three trainee)	6	Microsoft Windows 7/8/10 or UNIX/ LINUX or latest software	For all Systems
2	Power backup	For all Systems	7	Microsoft Office 2007/ 2010/ 2013 or latest software	For all Systems
3	Inkjet/Laser Printer (Network/USB Printer)	1	8	Antivirus Software (TVD/ Norton/ Quick Heal Total Security/ Kaspersky/ Any Popular brand)	For all Systems
4	Speaker	1	9	Internet Connection	For all Systems
5	Spare H/W components	As per requirement			