

**Competency Based Curricula
for**

**Short Term Courses based on
Modular Employable Skills (MES)**

**in
Bicycle & Tricycle Repair**



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Bicycle & Tricycle Repair

Name	:	Bicycle & Tricycle Repair
Sector	:	Automotive Repair
Code	:	AUR116
Entry Qualification & Age	:	Vth standard, 14 years & above
Duration	:	180 hours
Terminal Competency	:	

- Identify, select, use and store tools, equipments and materials used in Bicycle & Tricycle repair in a safe manner.
- Carry out repair of puncture
- Dismantle & assemble the Bi-cycle & Tricycle and troubleshoot the faults

CONTENTS:

Practical Competencies

- Use of protective clothing and boots
- Identify tools, equipments and materials used in Bicycle & Tricycle Repair
- Apply good house keeping practices, proper handling of materials and disposal of waste, follow statutory regulations.
- Store/lay materials at work in safe manner
- Use and store tools and equipments in a safe manner
- Select proper tools for a particular task

Underpinning Knowledge(Theory)

- Safety precautions, use of protective clothing and elementary first aid.
- Functions and uses of various tools and equipment.
- Reasons for carrying out good housekeeping practices
- Care and use of tools, equipment and materials used in Bicycle & Tricycle Repair
- Selection and correct use of tools

Practical Competencies

- Drive bicycle safely
- Repair puncture in bicycle/ tricycle
- Check the correctness of fault rectified
- Change tyre and tube
- Dismantle the bicycle / tricycle
(Sub-assemblies: Handle bar, steering assembly, fork assembly, Wheel assembly, drive system, brake system, bottom shell assembly)
- Clean and inspect parts; if necessary, repair/ replace the defective parts
- Assemble all the parts and check for sub-assembly's proper operations
- Trouble shoot the various problems occur during running
(Frequent loss of air pressure, chain slipping, wheel wobbling, free wheel mal functioning, pedal crank slipping, handle bar shaking, brake failure, hard pedaling, noise in running)
- Maintenance of bicycle & tricycle
(Cleaning, periodical checkup, lubrication and oiling, air pressure, brake , drive system, tyre tube valves)
- List out the materials and spares required for the given repair work
- Estimate cost of materials and spares required

Underpinning Knowledge(Theory)

- Safety rules and traffic symbols for two wheelers
- Procedure of Puncture repairing
- Method of testing for air leakage
- Tyre inflator and its uses
- Tube valve assembly and its function
- Safety precautions in puncture repair
- Functions of different parts of bicycle and tricycle
- Working steps on dismantling and assembling
- Method of aligning the wheel and balancing
- Probable cause-effect – remedy of faults in brake systems, steering systems, wheels and drive system
- Maintenance schedule and procedure for bicycle and tricycle
- Criteria for preparation of an estimate, various types of costs

Practical Competencies

- Estimate man power and time required for completing the work
- Estimate labour cost, overheads and cost of utilities (Power, water)
- Prepare an estimate for the repair work including profit

Underpinning Knowledge(Theory)

(fixed and variable cost), profit, calculation of total estimated cost

LIST OF TOOLS AND EQUIPMENTS

S.No	Description of tools	Quantity proposed for a batch of 20 trainees
1	Double end spanner 6 – 27mm	5 sets
2	Double end spanner ¼" – 1 1/8"	5 sets
3	Ring spanner 6 – 27mm	5 sets
4	Ring spanner ¼" – 1 1/8"	5 sets
5	Screw driver heavy duty 12"	10 Nos.
6	Phillips screw driver	5 set
7	Side Cutting plier 9"	5 Nos
8	Flat Nose plier 6"	5 Nos
9	Ball peen hammer 1 lb with handle	5 Nos
10	Adjustable spanner 20cm long	5 Nos
11	Pin punch 150 mm	5 Nos
12	Cold flat chisel 19 mm	5 Nos
13	Wheel balancing stand with rim bend remover	2 Nos
14	Nipple key	5 Nos
15	Adjustable tubular hacksaw frame	5 Nos
16	Tyre inflator foot operated	2 Nos
17	Tyre inflator hand operated	2 Nos
18	Anvil 50 kg with stand	2 Nos
19	Tyre levers	5 sets
20	Scissors 9 "	2 Nos
21	Rasp cut file 300 mm	5 Nos
22	End Cutting plier 9"	5 Nos
23	Box spanner 6 – 27mm	5 Nos
24	Hook spanner	5 Nos
25	Circlip plier 150 mm	5 Nos
26	Face pin wrench for hub shell	5 Nos
27	Grease gun 1 kg	2 Nos
28	Oil can 250 ml	2 Nos
29	Special spanner for fixed bottom race cup and for fork lock	2 Nos
30	Special spanner for pedal shaft and wheel cone nut	2 Nos
31	Special spanner for free wheel	2 Nos
32	Special spanner for fork lock nut, fork stem M25	2 Nos
33	Special spanner for bottom bracket, cup, lock ring , free wheel, free wheel body , rear cup adaptor, fork stem M 35	2 Nos
34	All in one spanner	2 Nos
35	Chain tensioner ratchet type and screw type	2 Nos each

S.No	Description of tools	Quantity proposed for a batch of 20 trainees
36	Water basin	5 Nos
37	Tyre tube puncture repairing kit	5 Nos
38	Slip joint multi grip plier	2 Nos
39	Drift punch 150 mm	2 Nos
40	Emery card	2 Nos
41	Wire brush	5 Nos
42	Old bicycle for spanner practice	2 Nos
43	Old tricycle for spanner practice	2 Nos
45	Wheel assembly	5 nos
46	Free wheel assembly	5 nos
47	Hub assembly	5 nos
48	Children cycle	2 Nos
49	Sports cycle	2 Nos
50	Handicapped cycle	1 No
51	Gym cycle	1 No

Consumables

1.	Kerosene	50 litres
2.	Lubrication Oil	10 litres
3.	Grease all purpose	10 kgs
4.	Cotton waste	30 kgs
5.	Soap Oil	5 litres
6.	Multipurpose grease	50 kgs
7.	Wheel bearing grease	50 kgs
8.	Emery sheet (rough smooth sand paper)	1 dozen
9.	Wire brush	5 Nos

MODULE

Name of Course: Sun control Film Fixing
Sector: Automotive Repair
Entry qualification: 5th standard passed
Age: 14 years completed
Duration of course: 60 Hrs
Code : AUR 117
Terminal Competency: On completion of course participant will be quality oriented
Fixers with modern installation Techniques competent to fix the Suncontrol film on 4 wheelers, commercial and house hold glass panels

Course Content:

<u>Under Pining knowledge (15 hrs)</u>	<u>Practical (45 Hours)</u>
<p>#Various Suncontrol film products: Non Reflective, High Performance, Reflective, Safety, Privacy, and Decorative etc.</p> <p>#Basics of measurement: Methods, units & conversion</p> <p>#Construction, properties & Benefits of products & their general coding</p> <p>#Product recommendations of various applications.</p> <p>#Product testing at Lab, Quality control & Handling-Packing, Storage and transportation of film</p> <p>#Types of Suncontrol film installation – Flat glass (Building/window) & automotive (door/window)</p> <p># Different methods of Shrinking.</p> <p># Tools used and their application</p> <p># Standard Safety procedures during installation</p>	<p># Demonstration on ideal work area cleanliness & its benefits .</p> <p>#Methods of taking the measurement of window glass right way and its practice</p> <p>#Identification of each tool used with its specific application</p> <p>#Demonstration of various Suncontrol film products.</p> <p>#Demonstration on various areas where the accident occurs during installation & precautions for avoiding the same.</p> <p>#Detailed practice on different types of shrinking techniques and film fixing on car and residential windows.</p> <p>#Understanding of Product coding used (CH-Charcoal, G- Grey, BR- Bronze, BL-Blue etc)</p> <p>#Demonstration on heat meter.</p>

<p># Importance of cleaning.</p> <p># Use of Heat Meter.</p> <p># Reverse Rolling Installation.</p> <p>#Removal and Re-tinting / Re-fixing Sun-Control film for Auto and Flat Glasses.</p> <p>#Flat Glass installation and special precautions.</p> <p># Statutory requirements for Automobile Tinting & Dealing with Customer</p>	<p>#Learning the techniques of easy way of removing the old film.</p> <p>#Recommendation of product to customer</p> <p>#Film fixing practice on various car models and building windows (Practice on minimum 10-15 standard car windows & House / commercial windows)</p> <p>#Soft skills and Dealing practice with customers</p>
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Required Tools/Equipment for the course:

1.Measuring tape

- 2. Squeegee**
- 3. Cutter**
- 4. Spray bottle**
- 5. Hot air gun**

6. Front & Rear automobile glass

7. Side door windows OR different models of cars for practice

8. Flat glass residential window

9.Heat Meter

10.Various product shade cards

Note 1:This module is also found suitable for persons with disabilities under the categories of Locomotor (One arm/one leg), Low vision, Hearing impaired and Mild mentally retarded (I.Q-50 to70)

Note2: Item No 1 to 5 requires One for each student and Item 6 to 10 ,One for 5 students.

List of members of Trade committee

Sl No	Name S/Sh	Organisation	Designation	Tel	email
1	O.P. Vaishya,	MIT College,Aurangabad 431005.	Director (Poly) ,	0240-2341202 09325212387	
2	Arvind M. Pathak	Car Care, Maruti Authorized Service Station. Town Center, CIDCO, Aurangabad431210	Owner	0240-2488929/ 39	
3	B S Kulkarni,	Garware Polyester Ltd, Aurangabad-431 201	General Manager	0240-2485465- 66 Cell 09850094317	bsk@garwarepoly.com
4	Kaladharan	Swaraj Mazda Lakozy Motors Pvt Ltd, Mumbai	Executive Director	9833856822	
5	Javed Pomatker	Madhuban Toyota LBS Marg Vidya Vihar Mumbai	Head-Customer Service		
6	Amar P.	St. Joseph ITC Donbosco, Kurla , Mumbai	Principal	9892456368	Amar_p77@yahoo.com
7	I R Bhilegaonkar	DVET,Mumbai	Astt App. Advisor	9869673513	Dk12_dvet@yahoo.com
8	Patil	Govt ITI, Govandi , Mumbai	Instructor (MMV)		
8	S A Zaidi	VRC,Mumbai	Dy Director (Rehab)	9892975454	Szh_zaidi53e@yahoo.co.in
9	R Senthil Kumar	RDAT,Mumbai	Regional Director	9323456800	rdatmum@nic.in
10	D K Pawagi	RDAT,Mumbai	Joint Director of Trg	9833563126	dkpawagi@yahoo.in
11	D K Jatav	RDAT,Mumbai	Assistant Director of Trg	9867745863	Devender_jatav@yahoo.com

List of Expert/Trade Committee Members

CURRICULUM DEVELOPMENT FOR SHORT TERM COURSES BASED ON MODULAR EMPLOYABLE SKILLS

SECTOR/AREA: AUTOMOTIVE REPAIR

- 01 S.Arivalagan, (Chairman)
Head – Training
M/S.Khivraj Motors (P) Ltd.,
Mount Road, Chennai-600 016
- 02 Shri.M.Sridhar
Joint Director of Training
Advanced Training Institute,
Guindy, Chennai-600 032
- 03 Shri.G.Vincent Raj,
Service Engineer/Proprietor,
“V” Care Bikes,
13, Rajeswari Colony, Paul Wells Road,
St.Thomas Mount, Chennai-600 016
- 04 Shri.P.Gandhi,
Manager – Works
M/S. Chirage Automobiles,
798, Mount Road, Chennai-600 035
- 05 Shri.M.Subbarayudu,
Assistant Director of Training,
Advanced Training Institute,
Guindy Chennai-600 032
- 06 Shri.Ramakrishna Gowda, (Convenor)
Assistant Director of Training,
Advanced Training Institute,
Guindy, Chennai-600 032
- 07 Ashwani Aggarwal
Deputy Director of Training
DGET

Module-1 (Level-I)

Name:	DRIVER CUM PEON
Sector:	Automotive Repair
Code:	AUR 118
Entry Qualification:	8 th pass
Age:	Minimum 20 years.
Terminal Competency:	After completing the training the candidate will be able to drive the car and do the necessary peon work.
Duration:	180 hrs

Note: On completion of the course the candidate has to obtain a valid Driving Licence as per RTO rules.

Syllabus

Practical Competencies	Underpinning Knowledge (Theory)
Office work: (25hrs) Postal and Courier <ul style="list-style-type: none">• Buying of postage, inland letters, post cards, etc• Registering a letter & AD• Sending a Money Order• Sending mail/Speed Post/Courier• Sending mail Under Certification of Posting• Depositing P.F. into the P.O.• EMO Banking <ul style="list-style-type: none">• Depositing of cash, cheques & drafts.• Withdrawal of cash via cheques & withdrawal slip.• Making of a DD. Transport <ul style="list-style-type: none">• Booking & sending a package by road & rail transport• Receiving goods from road transport. General Office Work <ul style="list-style-type: none">• Making a photo-copy• Buying office stationery• Filing of documents.• Telephone / Electric / Tax-bills• Paying the Tax & Insurance	<p>The working of a Post-Office and a Courier. The importance of registered post, Speed Post & Courier Ways of sending money. Different courier services and their operations</p> <p>The working of a Bank. The importance of a bearer cheque.</p> <p>The documents used in road & rail transport.</p> <p>Working of RTO/Motor Vehicle & Department. Understanding the importance of various documents relating to the Vehicle namely insurance, road-tax, emission (PUC), permits. Driving licence & fitness.</p>

<ul style="list-style-type: none"> • Getting a PUC for the vehicle. • Getting a Fitness Certificate of vehicle. • Application & Renewal Driving License 	
<p>Workshop Practice: (30hrs)</p> <p>Lubrication:</p> <ul style="list-style-type: none"> • Checking & topping up oil • Lubricating moving parts • Greasing via nipples <p>Tyres:</p> <ul style="list-style-type: none"> • Jacking & supporting the car • Checking tyre inflation. • Rotating tyres. • Replacing punctured tyres. <p>Oil & Filters:</p> <ul style="list-style-type: none"> • Draining engine oil. • Changing engine oil. • Changing fuel & air filters. <p>Spark Plug:</p> <ul style="list-style-type: none"> • Removing the spark plug. • Cleaning the spark plug. • Replacing the spark plug. <p>Petrol Smell:</p> <ul style="list-style-type: none"> • Checking the fuel tank. • Checking the fuel lines. • Checking the fuel pump. <p>Curing Starting Problems:</p> <ul style="list-style-type: none"> • Checking the battery. • Checking the HT leads. • Checking the spark-plug. • Checking the distributor cap. • Cleaning the points. • Replacing the points. <p>Engine Overheating:</p> <ul style="list-style-type: none"> • Checking the cooling system. • Checking the water pump. • Flushing the cooling system. • Cleaning the radiator. • Checking the timing. <p>Battery Maintenance:</p> <ul style="list-style-type: none"> • Cleaning and applying petroleum jelly. • Topping up the distil water. • Checking the charging. <p>Cleaning & Polishing:</p> <ul style="list-style-type: none"> • Cleaning the interior. • Cleaning & washing the exterior. • Polishing the metal parts. <p>Maintaining a Log -book</p>	<p>The importance of lubrication. The different types of lubrication used in vehicles.</p> <p>Different parts of a tyre. The relation of inflation with road grip The need for the rotation & alignment of tyres. The process of repairing a tyre. How oil is cleaned. How air is filtered. When filters needs to be replaced.</p> <p>The use of a spark plug. The different parts of a spark plug. How a spark plug fails to function.</p> <p>The danger of a fuel fire. The positioning of the fuel tank and fuel lines. Awareness of LPG & CNG as fuel</p> <p>Simple testing of a battery. The ignition system of a vehicle. The purpose of different elements in the ignition system, compression ignition & spark ignition.</p> <p>The need for the cooling system. The positioning of the different elements of the cooling system. The fan and its belts. The timing mechanism.</p> <p>Basic parts and working of a battery. The difference between primary and secondary cells. The need for distil water. How a battery is charged and discharged.</p> <p>The necessity of cleaning. The process of cleaning different materials.</p>
<p>Driving: (100hrs)</p>	

<ul style="list-style-type: none"> • Performing cockpit checks. • Performing safety checks. • Identifying controls & Instruments. • Driving Away & Stopping. • Safe Positioning. • Adjusting & using the mirrors. • Giving the correct signals. • Anticipating & Planning. • Use of Speed. • Interacting with other traffic. • Negotiating junctions. • Negotiating roundabouts. • Pedestrian crossing. • Driving on a highway. • Driving at night. • Turning the vehicle around. • Reversing. • Parking. • Operation of Remote & Child lock. • Emergency stop. 	<p>The different parts of a car. The working of the engine. The drive train. The importance of the clutch. The brakes and their application. The need and use of gears. Road signs & signals with special stress on lane & highway driving. The dash-board instruments and their use. Loading and safety. Luggage and its positioning.</p>
<p>Etiquette & First Aid: (25hrs)</p> <ul style="list-style-type: none"> • Learning Good Manners. • Personal Hygiene • Care of driving while carrying school children. • Giving First-Aid. • Dealing with a Road accident. • Performing Eco-Driving & avoiding rash and negligence driving. • The proper use of a horn. 	<p>The necessity of good manners. The first-aid used in different situations. CPR- (Cardiopulmonary resuscitation) Global warming and tail pipe emissions. Knowledge of the different documents required for a vehicle. First party & Third party insurance. Filing an accident report. Proper use of a mobile by a driver. (when to use & when-not) Sensitivity to passenger needs.</p>

Tools & Equipment:

1. One dedicated training car fitted with a dual brake & a dual clutch.
2. Assorted hand tools.
3. Road sign charts.

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