AUTO ELECTRICIAN [AUEL]

General Information:

1. Name of the Trade : Auto Electrician
2. Entry Qualification : Passed Class VII I
3. Duration of Training : 06 Months [Under Vocational Short Term Course)

Rationale :

Auto mobiles both two wheelers and four wheelers are used extensively as a means of transport in our daily life. Electrician and electronics circuits and device are incorporated in automobiles for operation, safety and security of passengers and users. The use of sophisticated circuit has been developed rapidly. Lacks of trained persons in rural, semi rural and even in urban areas is felt by users for looking after the electrical and electronics circuits and control devices.

A vocational curriculum on 'Auto Electrician' will ensure the performance at the highly standard by the users. This curriculum will produce auto electricians who can meet the challenges by the developments in technology.

Aims:

To produce a competent work force who can repair, maintain and troubleshoot of electrical and electronic circuits in a modern automobile.

Course Break-up:

(a)	Practical instruction	:	288 Hours.
(b)	Theoretical instruction	:	67 Hours
(c)	Entrepreneurial Institution	:	05 Hours
		Total =	360 Hours

Marks Alloted :

(a) Practical	:	400
(b) Theory	:	100

Industrial Visit :

The Course content is to be covered in less then 26 weeks since some weeks will be used for enrolment procedures, leave of the instructor, holidays, examination and tests, industrial visits etc.

Industrial Visit :

Industrial visit to at least two different industries is necessary.

Course Content

THEORY **67 Hrs.**

1. Measuring Electrical Parameters using Appropriate Instrument : (14 Hrs.)

1.1 Sources of electrical power in an automobile.
1.2 Units of Voltage and Current, relationship between m V, V, mA, A.
1.3 Instruments used to measure current, voltage, power, their connection and application.
1.4 Relationship between voltage, current, power, energy, simple calculation.
1.5 Concept of insulator, conductor, semi conductor.
1.6 Basic electro-magnetism, concept of inductance.
1.7 Concept of service, parallel and mixed circuits, simple calculation.

2. Different Electrical and Electronics Circuits in an Automobile : (2 Hrs)

2.1 Symbol and notations of electrical/electronic components used in Automobile.
2.2 Tracing of circuits, use multimeter for tracing.
2.3 Wire colour code, verification using multimeter.

3. Electrical Systems : (5 Hrs.)

3.1 Introduction to vehicle and major components.
3.2 Safety precaution in driving.
3.3 Working of diesel and petrol engine.
3.4 Electrical system in a automobile.
3.5 Types of manufacturing (electrical) in a automobile:

4. Plan of a Auto Electrical workshop : **(3 Hrs.)**

4.1 Criteria for layout of a workshop.
4.2 Maintenance considerations.

5. Charging of a battery : **(6 Hrs.)**

5.1 Need for Charging.
5.2 Specification under discharge charged and fully charged condition.

6. Overhaul, Troubleshoot and testing a starter Motor: **(6 Hrs.)**

6.1 Trouble shooting procedures for starting system and starting motor.

7. Overhauling of Dynast Art : **(3 Hrs.)**

7.1 Construction of dynestart, working principals, functions.

8. Reassemble a D.C Generator. & A.C Generator: **(8 Hrs.)**

3.1 Construction details of D.C Generator & A. C Generator.
3.2 Working principle, specifications of D.C & A:C Generator.
8.3 Types of faults- electrical of D.C & A.C Generator.

8.4 Procedure of dismantling, disassembling and .reassembling

8.5 Rectification of faults.

8.6 Associated precautions.

9. Auxiliary Circuits : **(5 Hrs)**

9.1 Identification & Specifications of different auxiliary circuits.

9.2 Methods of tracing circuits.

10. Wearing Harness: **(2 Hrs)**

10.1 Wiring diagram with colour code, wire size with terminal code number and accessories.

11. Ignition System: **(5 Hrs)**

11.1 Type of ignition system, identification of components, testing of components.

11.2 Magnetic pulse distributor electronic ignition system.

11.3 Troubleshooting procedure for ignition system.

11.4 Use of engine analyzer, auto oscilloscope.

12. Trace lighting circuit : **(5 Hrs)**

12.1 Layout of lighting circuits.

12.2 Fault location & rectification.

13. Market survey: **(3 Hrs)**

13.1 Market survey technique.

13.2 Proforma for survey.

13.3 Survey report preparation.

PRACTICAL :

1. Measurement of Electrical Parameters: **288 Hrs.**

1.1 Select appropraate instrument to measure the followings:
a) Current, b) Voltage, c) Power, d) Resistance, e) Impedance

1.2 Relate the circuit in the drawings with the actual circuit in automobile.

1.3 Translate & electrical circuit of & automobile into an electrical drawing with specifications marked.

2. Drive vehicle Test Different Electrical systems.

2.1 Drive a vehicle forward / backward, turning movement park.

2.2 Identify major electrical components and circuits in a vehicle and draw a block diagram.

2.3 Identify different parts of diesel and petrol engine.

3. Auto Electrical Workshop:

3.1 Sketch and Auto electrical workshop as per space available, given due consideration of planning.

3.2 Maintain general cleanness and order in the workshop.

4. Test, Repair and Maintain a Battery :

4.1 Identify the faults correctly and advise customer accordingly, if required.

4.2 Repair remove faults.

4.3 Test the battery to ensure fault has been removed.

4.4 Measure the voltage of each cell and battery correctly.

4.5 Set the battery charger as per the charging requirement.

4.6 Connect the battery property for charging.

4.7 Prepare estimates for repairs of lead acid batteries with different faults.

4.8 Prepare estimates for charging the battery.

5. Overhaul, Troubleshoot and Test of starter Motor :

5.1 Overhaul starter drive.

5.2 Test and overhaul solenoid.

5.3 Conduct on drive test of starter.

5.4 Identify and rectify it starter fails to rotate, rotates slowly, does not crack the engine, unable to engage and disengage.

5.5 Overhaul dynast art following manufacture's manual.

5.6 Test performance after overhauling.

6. Dismantle, Disassemble Test, Set Regulator Cut out & Reassemble a A.C. Generator:

6.1 Dismantle the Generator from the monitoring using appropriate tools properly, adopting precautionary measures.

6.2 Disassemble the Generator using appropriate tools properly, adopting safety measures.

6.3 Reassemble the Generator.

7. Dismantle, Disassemble, Test Set Regulator cut out Reassemble a A.C. Generator:

7.1 Dismantle the generator from the mounting using appropriate tools properly, adopting precautionary measures.

7.2 Disassemble the generator using appropriate tools properly, adopting safety measures.

7.3 Replace components and rectify defects.

7.4 Reassemble the generator.

8. Trace Auxiliary Circuits :

8.1 Trace auxiliary circuits using a multimeter and or test lamp.

9. Prepare Wiring Harness:

9.1 Prepare wiring harness as per wiring diagram properly.

9.2 Test the wiring using multimeter / or a test lamp.

10. Trace and Test Ignition System:

10.1 Trace electronics ignition system from the vehicle.

10.2 Prepare ignition circuit with CB point and Set CB point.

10.3 Test ignition coil and condenser with test jig.

10.4 Test, clean and set spark plug.

10.5 Rectify sparking defects in ignition system.

11. Lighting System :

11.1 Identify and check layout of various lighting circuits of the vehicle.

11.2 Identify and rectify faults of various electrical circuits of a vehicte.

11.3 Identify various circuits for gauges and indicators.

12. Market Survey

12.1 List of formalities for setting up auto electric workshop and file in documents

ENTREPRENEURIAL INSTRUCTION

SL No.	Course Curriculum	Hours
1.	Brief idea on nature of small business management and Industrial Technical skill.	
2.	Preparation of schemes and vetting to Financial Institutions/ Lead Bank for obtaining loans.	
3.	Rules for setting up of business / production Unit.	
4.	Maintenance of Accounts; Labour Capital etc.	
5.	Man Management, Communication, Motivation.	
6.	Operational Management.	
7.	Market Survey.	
8.	Quality Control.	
9.	Visit to Industrial units for gathering idea to start the unit.	
10.	Choice of technology as per demand of local people of the District / State.	
11.	Knowledge of Sales Tax etc.	
12.	Brief idea for Registration of SSI, Trade License, Project Report, Proposal for loans etc.	
		Total 05