

GOVERNMENT OF THE PUNJAB
**TECHNICAL EDUCATION & VOCATIONAL
TRAINING AUTHORITY**



CURRICULUM FOR
AUTO ELECTRICIAN
(6-MONTHS COURSE)

CURRICULUM WING TEVTA
58-A L – BLOCK GULBERG –III LAHORE
PHONES Nos 5868409 5868475

TRAINING OBJECTIVES

Demand for the trained Auto Electricians is enhancing day by day. Because of more and more automobiles on the roads, and more important are the Hi-Tech changes especially after 1990 in this country. In future it will require qualified and trained persons to intercept the problems

At the end of this training course, the trainees will be able to: -

- Identify tools of Auto Electrician and use them correctly.
- Measure with vernier caliper, and dial, gauge etc.
- Solder the joints.
- Maintain the batteries
- Service the self starters, and Alternators
- Complete the wiring circuits of Car.
- Locate the troubles/ Fault finding.

CURRICULUM SALIENTS

Emphasis will be given on character building of trainees during their training by delivering them motivational lectures on, patriotism, discipline and dealing with customers, market people and colleague.

Entry Level	Middle
Total duration of course	6-Months
Total Training Hours	360-Hours
	3-Hours a day
	5-days a week
Training Methodology	90% Practical
	10% Theory

SKILL REQUIREMENTS

At the end of the course, the trainees must be able to:

- Use Auto Electrician workshop tools and equipment efficiently
- Maintenance and charging of batteries.
- Perform simple workshop techniques as series and parallel circuits, making tester, jumper wires, soldering, tapping, sleeving, connecting thimble etc.
- Disassemble and assemble the self-starters and to check and its service.
- Disassemble and assemble the AC-generators to check & service.
- Understand wiring diagrams of popular vehicles in the country.
- Install components, switches, Fuses and relays.
- Wire up the electrical circuits.
- Locate the faults and applying remedies.

KNOWLEDGE REQUIREMENTS

At the end of the course, the trainees must have the enough knowledge of the following: -

- Basic workshop skills, and safety.
- Basic electric terms.
- Names and use of workshop tools.
- Various electrical components, their location, operation, and function.
- Construction and function of battery.
- Construction and function of self-starter.
- Construction and function of Alternator.
- Construction and function of voltage Regulators.
- Construction and function of Relays.
- Introduction to various electrical component
- Different circuits applied in a Car wiring.

COURSE CONTENTS

Basic Knowledge

6-Hours

1. Introduction to hand tools and their use.
2. Measuring Introductions.
3. Safety Precautions
4. Basic electricity.

Bench work

6-Hours

1. Filing
2. Drilling
3. Sawing
4. Fitting

Battery

3-Hours

1. Purpose.
2. Principle.
3. Function.
4. Construction.

Starting System

3-Hours

1. Purpose
2. Principle
3. Function
4. Construction

Charging System

6-Hours

1. Purpose.
2. Principle.
3. Function.
4. Construction.

Ignition System**6-Hours**

1. Purpose.
2. Principle.
3. Function
4. Construction
5. Types.

Electrical and Electronic Devices**6-Hours**

1. Function and Construction of
2. Various Lights, switches, and fuses.
3. Horn, Wiper
4. Instrument panel lights and gauges.

LIST OF PRACTICAL

Basic

30 Hours

1. Filing.
2. Marking.
3. Sawing.
4. Drilling.
5. Threading.

Measuring

30 Hours

1. Steel foot rule.
2. Vernier caliper.
3. Micrometer.
4. Dial gauge.
5. Feeler gauge

Basics of Electrician

69 Hours

1. Introduction to Fasteners and materials.
2. Demonstration with magnet Box.
3. Insulation removal, connecting wires tapping, sleeving, connecting thimbles.
4. Marking jumper wires and test lamp.
5. Use of AVO meter, Use of Ampere and voltmeters in series and parallel circuit, checking voltage drop.
6. Soldering Exercises: Fix Joint, eye Joint, and lap joint etc.

Battery

30 Hours

1. Cautions for battery service.
2. Preparation of Electrolyte.
3. Checking Specific gravity.
4. Battery charging.
5. Battery testing.
6. Analysis and troubleshooting.
7. Battery removing and replacing.
8. Care of Batteries in stock.
9. Making terminals of battery.
10. Dry batteries.

Starting System**30 Hours**

1. Trouble shooting.
2. Specifications.
3. Starting system circuit on vehicle.
4. Checking, removal and installation.
5. Disassembly.
6. Identification of parts.
7. Complete checking and inspection of all components according to workshop manual.
8. Assembling of starting motor.
9. Performance tests of motor on test bench.

Charging system**30 Hours**

1. Trouble shooting.
2. Specifications.
3. Charging system checking on vehicle.
4. Fan belt adjusting.
5. Dismantling alternator.
6. Parts identification.
7. Complete inspection of parts according to workshop manual.
8. Replacing carbon brush and bearing.
9. Diode testing.
10. Assembling Alternator.
11. Double unit voltage Regulator.
12. Identifying connections and making circuits.
13. Installing IC regulators.

Ignition System.**30 Hours**

1. Trouble shooting.
2. Spark test, inspection of high tension leads.
3. Spark plug fouling study.
4. Ignition coil checking.
5. Ignition circuit checking.
6. C.B Point replacing and gap adjusting.
7. Setting Ignition timing.'
8. Checking air gap and pick up coil.
9. Dismantling, checking and fitting distributor.
10. Fitting C.B point and condenser and starting coil on motorcycle.

Wiring Circuits on Wiring Board**30 Hours**

1. Reading wiring diagrams.
2. Legal requirements.
3. Making thimble connectors.
4. Color codes.
5. Head lamp circuit with relay.
6. Aiming headlights.
7. Parking brake circuit.
8. Hazard warning circuit.
9. Indicator circuit.
10. Brake light circuit.
11. Brake light circuit.
12. Reverse gear light circuits.
13. Door and roof light circuit.
14. Horn circuit and adjustment.
15. Fuel gauge circuit.
16. Oil pressure light circuit.
17. Trunk and hood light.
18. Temperature gauge circuit.
19. Brake fluid level light circuit.
20. Power window circuit.
21. Wind shield and wiper motor circuit.
22. Electric Fan circuit.
23. Glow plug circuit.
24. Electrical shut off valve circuit.
25. Radio and speaker circuit.
26. Car air conditioning and heating system wiring.

INDUSTRIAL VISITS**15 Hours**

LIST OF MACHINERY / EQUIPMENT / TOOLS ETC
(For a class of 25 Students)

Name of Trade	AUTO ELECTRICIAN
Duration of Course	6-Months

Sr.No.	Nomenclature of Equipment / Tools	Quantity
1.	Combination open end ring spanner set (6-32mm)	05 Nos.
2.	Double end off set ring spanner (6-32mm)	05 Nos.
3.	Socket set (8-32 mm)	05 Nos.
4.	Allen Key set (1.5-10mm)	05 Nos.
5.	Adjustable wrench (1')	05 Nos.
6.	Combination plier (20cm)	05 Nos.
7.	Side cutter plier (16cm)	05 Nos.
8.	Lock Plier (15cm)	05 Nos.
9.	Long Nose Plier (16cm)	05 Nos.
10.	Grip Plier (10inch)	02 Nos.
11.	Crimping Plier	02 Nos.
12.	Ball Peen Hammer (250gm, 500gm)	05 each.
13.	Plastic Hammer	05 Nos.
14.	Flat Screw driver (4' 6' 8' 12')	02 each.
15.	Philip screwdriver (3' 4' 6' 8')	02 each.
16.	Hammer screw driver set	02 Nos.
17.	Hacksaw frame (300mm)	25 Nos.

18.	File (flat)with handle (150 to 300)	25 Nos.
19.	File with handle (Round) (150 to 300)	25 Nos.
20.	Tri square (6 inches)	20 Nos.
21.	Hand drill Machine (Electric)	02 Nos.
22.	Twist drill set (1mm to 12mm)	02 Nos.
23.	Diode removing and fitting tools	01 Nos.
24.	Vernier Caliper (0-160mm)	05 Nos.
25.	Micrometer (0-25mm)	05 Nos.
26.	Dial Indicator with Stand (0.01 mm)	02 Nos.
27.	Wire gauge (standard)	02 Nos.
28.	Feeler gauge (0.5 to 1 mm with 10 blade)	05 Nos.
29.	Volt Meter (0-20 V)	05 Nos.
30.	Ampere Meter (0-25 Amp)	05 Nos.
31.	Multi-meter	02 Nos
32.	Techno-meter & Dwell Meter (Standard 4 to 8 cylinders)	02 Nos.
33.	Hydrometer	10 Nos.
34.	Steel foot rule (30cm)	05 Nos.
35.	Ignition timing light	02 Nos.
36.	Growler Tester	02 Nos.
37.	Soldering Iron (45 W & 75 W)	10 Each.
38.	Tool kit (empty)	05 Nos.
39.	Oil Can (0.25 litter)	05 Nos.
40.	V-Blocks	04 Nos.
41.	Bench press	01 Nos.

42.	Bench voices (05" size)	05 Nos.
43.	Work benches (6'x 2.5'x 2.75')	05 Nos.
44.	Writing board	02 Nos.
45.	Battery charger	02 Nos.
46.	Battery terminal cleaner	02 Nos.
47.	Wiring Board	02 Nos.
48.	Battery capacity tester	02 Nos.
49.	Commutator hacksaw with blade different size	03 Nos.
50.	Digital Avo Meter	02 Nos.
51.	Socket screw driver (02 to 10 mm)	05 sets.
52.	Battery clamp expender (standard size)	02 Nos.
53.	Battery terminal puller	04 Nos.
54.	Condenser tester (0.02 to 0.25 uf)	02 Nos.
55.	Diode Tester	02 Nos.
56.	Tool Cabinet (18"x24"x36")	04 Nos.

EMPLOYABILITY OF PASS-OUTS.

Pass outs in “Auto Electricians” trade can find employment opportunities in the following sectors.

- Self employment (workshop)
- Authorized sales / service dealers
- Auto Parts manufacturing industries, vendors etc.
- Private workshops.
- Potential manufacturer’s having large transport fleet.

STANDING OPERATING PROCEDURE FOR EVALUATION OF SHORT COURSE STUDENTS.

Following procedure will be followed for the evaluation of students of short courses: -

- 1 Admitted students will be registered with the Punjab Board of Technical Education Lahore within one month after the last date of admission.
- 2 The testing of the students shall be carried out as follows: -

a. **Grading System (Theory & Practical).**

A+	Grade from 80% and above.
A	Grade from 70% to 79%.
B	Grade from 60% to 69%
C	Grade from 50% to 59%
F	Less than 50%.
Fail	Below 40% in Theory & 50% in Practical

- Candidate has to pass both Theory & Practical

b. **Attendance.**

Students below 80% attendance will not be admissible to appear in examination.

c. **Examining Body.**

Punjab Board of Technical Education, Lahore will be the Testing and Evaluation Authority.

d. **Testing.**

1. **Conduct.** The testing shall be conducted in respective institutions under overall supervision of PBTE.

2. **Methodology.**

Following testing methodology will be adopted:-

(a)	Class attendance / participation	=	10%
(b)	Sessional Performance	=	40%
	(Practical exercises/ quizzes / assignments).		
(c)	Final Exams.		
	i Theory	=	10%
	ii Practical.	=	40%
	Total	=	<u>100%</u>

- 3 The institute concerned will forward the result of students to Punjab Board of Technical Education Lahore on TEV/CURR/F-1 form (Attached) within seven days of termination of course.
- 4 Punjab Board of Technical Education will process the result carrying out its scrutiny / vetting and issue certificate to successful candidates as per specimen attached.

- 5 The secretary PBTE will also coordinate for the endorsement of the said certificate by General Manager (Academic).

