

ATA-E100 CURRICULUM FRAMEWORK

AUTOMOTIVE TECHNICAL ACADEMY (ATA)

ATA-E100

General Automotive Electrical

Curriculum Framework (Version 1.0)

Programme Status: Proposed for Locking

Programme Information

Programme Code: ATA-E100

Programme Title:

General Automotive Electrical

Qualification Level:

Professional Diploma – Level 2

Duration:

48 Weeks

Training Days:

5 Days per Week

Hours Per Day:

8 Hours

Total Contact Hours:

1,920 Hours

Teaching Philosophy

- **70% Practical = 1,344 Hours**
 - **30% Theory = 576 Hours**
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Entry Requirement

Successful completion of:

ATA-E000 Electrical & Electronics Foundation

or approved Recognition of Prior Learning (RPL).

Programme Goal

To produce professional automotive electricians capable of independently diagnosing, repairing, installing, testing, calibrating, and maintaining electrical systems in modern petrol,

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diesel, hybrid-ready, and emerging 48V vehicles using OEM procedures, professional diagnostic equipment, and industry best practices.

Graduate Competency Profile

Graduates shall be able to:

- Diagnose electrical faults systematically.
 - Interpret OEM wiring diagrams.
 - Repair complete vehicle wiring systems.
 - Diagnose CAN-related electrical faults (foundation level).
 - Service charging systems.
 - Service starting systems.
 - Diagnose lighting systems.
 - Diagnose body electrical systems.
 - Service comfort electronics.
 - Repair connectors and harnesses.
 - Perform voltage drop analysis.
 - Perform current draw analysis.
 - Use professional multimeters.
 - Use clamp meters.
 - Use lab scopes (foundation to intermediate).
 - Use battery analyzers.
 - Use scan tools for electrical diagnostics.
 - Produce professional diagnostic reports.
 - Apply workshop quality control procedures.
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Programme Structure

Module	Title	Weeks	Hours
E100-01	Professional Automotive Electrical Workshop Practice	3	120
E100-02	Electrical Measurement & Diagnostic Instruments	4	160
E100-03	Batteries, Starting & Charging Systems	7	280
E100-04	Vehicle Wiring Systems & Harness Engineering	7	280
E100-05	Lighting, Signalling & Visibility Systems	5	200

ATA-E100 CURRICULUM FRAMEWORK

Module	Title	Weeks	Hours
E100-06	Body Electrical Systems	6	240
E100-07	Climate Control Electrical Systems	3	120
E100-08	Vehicle Communication Networks (Electrical Perspective)	4	160
E100-09	Integrated Electrical Diagnostics	5	200
E100-10	Industrial Attachment, Capstone Project & Final Assessment	4	160
TOTAL		48 Weeks	1,920 Hours

Module 1

Professional Automotive Electrical Workshop Practice

Duration

3 Weeks

Core Areas

- Electrical workshop organisation
- Professional workflow
- Advanced PPE
- OEM repair procedures
- Tool calibration
- Quality assurance
- Job documentation
- Customer communication
- Workshop management fundamentals
- Diagnostic methodology

Module 2

Electrical Measurement & Diagnostic Instruments

Duration

4 Weeks

Students master:

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- Digital multimeter
 - Clamp meter
 - Oscilloscope
 - Current probes
 - Power probe
 - Battery tester
 - Charging system analyzer
 - Insulation tester
 - Test light
 - Logic probe
 - Signal generator (introductory)
 - Scan tool integration
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Module 3

Batteries, Starting & Charging Systems

Duration

7 Weeks

Topics include:

- Lead-acid batteries
 - AGM batteries
 - EFB batteries
 - Battery testing
 - Battery management systems (introduction)
 - Starter motors
 - Starter circuits
 - Solenoids
 - Alternators
 - Smart alternators
 - Voltage regulators
 - Charging diagnostics
 - Current draw testing
 - Parasitic drain diagnosis
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Module 4

Vehicle Wiring Systems & Harness Engineering

Duration

7 Weeks

Topics include:

- Harness construction
 - Harness routing
 - Connector systems
 - Terminal repair
 - Wire repair
 - Crimping
 - Soldering (where manufacturer-approved)
 - Heat shrink techniques
 - Weatherproof connectors
 - Voltage drop diagnostics
 - Circuit integrity testing
 - OEM wiring standards
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Module 5

Lighting, Signalling & Visibility Systems

Duration

5 Weeks

Topics include:

- Halogen systems
- HID systems
- LED systems
- Adaptive lighting
- Matrix lighting (overview)
- Fog lamps
- Brake lights
- DRLs
- Indicators
- Hazard systems

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- Wipers
 - Washers
 - Rain sensors
 - Headlamp levelling
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Module 6

Body Electrical Systems

Duration

6 Weeks

Topics include:

- Power windows
 - Central locking
 - Mirrors
 - Power seats
 - Interior lighting
 - Exterior lighting control
 - Horn systems
 - Immobilizer (electrical interface)
 - Body Control Module (BCM) functions
 - Comfort electronics
 - Basic alarm wiring
 - Tailgate systems
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Module 7

Climate Control Electrical Systems

Duration

3 Weeks

Topics include:

- Blower motors
- Blower controllers
- HVAC electrical circuits
- Control panels
- Temperature sensors

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- Pressure switches
 - Cooling fan electrical control
 - Compressor clutch circuits
 - Electronic HVAC diagnostics
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Module 8

Vehicle Communication Networks (Electrical Perspective)

Duration

4 Weeks

Topics include:

- Network fundamentals
- CAN Bus
- LIN Bus
- FlexRay (overview)
- Automotive Ethernet (overview)
- Network diagnostics (foundation)
- Module communication faults
- Terminating resistors
- Basic waveform recognition
- Network troubleshooting strategy

Note: Advanced CAN decoding and ECU communication analysis are reserved for **ATA-E200**.

Module 9

Integrated Electrical Diagnostics

Duration

5 Weeks

Students perform complete vehicle diagnostics involving:

- No-start conditions
- Charging faults
- Lighting faults
- Body electrical faults
- Wiring faults

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- Voltage drop analysis
 - Current draw testing
 - Customer complaint analysis
 - Diagnostic reporting
 - Verification testing
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Module 10

Industrial Attachment, Capstone Project & Final Assessment

Duration

4 Weeks

Students complete:

- Supervised industry placement
 - Major electrical repair project
 - Comprehensive fault diagnosis
 - Portfolio presentation
 - Oral technical defence
 - Final written examination
 - Practical trade test
 - Exit competency assessment
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Laboratory Requirements

The programme requires dedicated laboratories for:

1. Automotive Electrical Fundamentals Lab
 2. Battery & Charging Systems Lab
 3. Starter Systems Lab
 4. Wiring & Harness Fabrication Lab
 5. Lighting & Visibility Systems Lab
 6. Body Electronics Lab
 7. Electrical Diagnostics Lab
 8. Scan Tool & Oscilloscope Lab
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Assessment Structure

Assessment	Weight
Continuous Practical Assessment	35%
Practical Trade Tests	30%
Written Examinations	20%
Capstone Project	10%
Professional Conduct & Portfolio	5%
TOTAL	100%