



Automotive Technical Academy (ATA)

Faculty of Automotive Electrical & Electronics



Curriculum with Course Syllabus

Department: GENERAL AUTOMOTIVE ELECTRICAL

Semester 1-4 | Core Courses + ATA 2040 Electives + SIWES + Capstone with Course Codes (AGE 101-AGE 404)

AGE 101 – Workshop Safety & Electrical Tools

Credit Hours	2 (1T/1P)
Course Description	Electrical safety, PPE, use of meters and test tools.
Syllabus / Topics	• PPE • Multimeters • Test lamps • Oscilloscopes
Practical Activities / Lab Work	• Safety drills, tool demonstrations
Assessment Methods	CA 20% Practical 40% Exam 40%
Learning Outcomes	Apply safety in electrical environments.
Accreditation Mapping	NBTE NID Safety ASE
AI/Future Module ↘	VR Electrical Safety Simulator

AGE 102 – Fundamentals of Electricity

Credit Hours	3 (2T/1P)
Course Description	Voltage, current, resistance, Ohm's Law.
Syllabus / Topics	• Voltage • Current • Resistance • Ohm's Law
Practical Activities / Lab Work	• Build simple DC circuits



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Assessment Methods	CA 20% Practical 40% Exam 40%
Learning Outcomes	Explain and apply electrical principles.
Accreditation Mapping	NBTE NID ASE
AI/Future Module ↘	AI Circuit Analyzer

AGE 103 – Automotive Batteries & Power Storage

Credit Hours	2 (1T/1P)
Course Description	Lead-acid, AGM, lithium batteries.
Syllabus / Topics	• Battery types • Storage principles
Practical Activities / Lab Work	• Battery testing, charging, servicing
Assessment Methods	CA 20% Practical 40% Exam 40%
Learning Outcomes	Service and diagnose automotive batteries.
Accreditation Mapping	NBTE NID IMI-UK
AI/Future Module ↘	Smart Battery Analyzer

AGE 104 – Wiring, Terminals & Connectors

Credit Hours	2 (1T/1P)
Course Description	Harness design, terminals, splicing.
Syllabus / Topics	• Harness design • Terminals • Connectors
Practical Activities / Lab Work	• Build wiring harness workshop
Assessment Methods	CA 20% Practical 40% Exam 40%
Learning Outcomes	Construct and service wiring harnesses.
Accreditation Mapping	NBTE NID ASE
AI/Future Module ↘	AR Wiring Layout Trainer

AGE E1 – Intro to CAD for Wiring Harness (Elective)

Credit Hours	2 (0T/2P)
Course Description	Introductory CAD for harness design.
Syllabus / Topics	• CAD basics • Harness modeling
Practical Activities / Lab Work	• CAD harness design workshop
Assessment Methods	Project 100%
Learning Outcomes	Apply CAD for harness design.
Accreditation Mapping	NBTE Elective IMI-UK
AI/Future Module ↘	CAD Harness Designer

AGE 201 – Charging Systems

Credit Hours	3 (1T/2P)
Course Description	Alternators, regulators, rectifiers.
Syllabus / Topics	• Alternators • Voltage regulators • Rectifiers
Practical Activities / Lab Work	• Bench test alternator



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Assessment Methods	CA 20% Practical 40% Exam 40%
Learning Outcomes	Service charging systems.
Accreditation Mapping	NBTE NID ASE
AI/Future Module ↘	AI Alternator Diagnostic

AGE 202 – Starting Systems

Credit Hours	3 (1T/2P)
Course Description	Starters, solenoids, circuits.
Syllabus / Topics	• Starters • Solenoids • Circuits
Practical Activities / Lab Work	• Starter motor teardown
Assessment Methods	CA 20% Practical 40% Exam 40%
Learning Outcomes	Diagnose starting system faults.
Accreditation Mapping	NBTE NID ASE
AI/Future Module ↘	AI Fault-Finding App

AGE 203 – Lighting & Accessories

Credit Hours	2 (1T/1P)
Course Description	Headlamps, signals, interior lights.
Syllabus / Topics	• Headlamps • Indicators • Interior lighting
Practical Activities / Lab Work	• Lighting circuit setup
Assessment Methods	CA 20% Practical 40% Exam 40%
Learning Outcomes	Install and repair lighting systems.
Accreditation Mapping	NBTE NID ASE
AI/Future Module ↘	Smart Lighting Tester



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AGE 204 – Sensors & Actuators I

Credit Hours	2 (1T/1P)
Course Description	Basic sensors (temp, pressure, position).
Syllabus / Topics	• Temperature sensors • Pressure sensors • Position sensors
Practical Activities / Lab Work	• Sensor testing with oscilloscope
Assessment Methods	CA 20% Practical 40% Exam 40%
Learning Outcomes	Test and interpret basic sensor signals.
Accreditation Mapping	NBTE NID ASE
AI/Future Module ↘	IoT Sensor Analyzer

AGE E2 – AR Troubleshooting of Circuits (Elective)

Credit Hours	2 (0T/2P)
Course Description	AR troubleshooting of automotive electrical circuits.
Syllabus / Topics	• AR interface • Fault simulation
Practical Activities / Lab Work	• Simulate AR troubleshooting
Assessment Methods	Project 100%
Learning Outcomes	Use AR to troubleshoot electrical circuits.
Accreditation Mapping	NBTE Elective IMI-UK
AI/Future Module ↘	AR Circuit Fault Finder

AGE 301 – SIWES Internship

Credit Hours	6 (0T/6P)
Course Description	Six-month supervised internship in automotive electrical service workshops.
Syllabus / Topics	• Weekly logbook • Supervisor reviews
Practical Activities / Lab Work	• On-the-job diagnostics and servicing
Assessment Methods	Supervisor Report 50% Logbook 30% Oral 20%
Learning Outcomes	Apply electrical diagnostics in industry settings.
Accreditation Mapping	NBTE SIWES ASE
AI/Future Module ↘	IoT Internship Logbook



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AGE 401 – Capstone Project

Credit Hours	6 (0T/6P)
Course Description	Independent project on automotive electrical innovation.
Syllabus / Topics	• Proposal • Execution • Defense
Practical Activities / Lab Work	• Develop smart charging system or IoT diagnostic tool
Assessment Methods	Project 50% Report 30% Defense 20%
Learning Outcomes	Execute project demonstrating electrical innovation.
Accreditation Mapping	NBTE NID ASE
AI/Future Module ↘	AI Electrical Design Optimizer

AGE 402 – Sensors & Actuators II

Credit Hours	3 (1T/2P)
Course Description	Advanced sensors (oxygen, MAP, MAF).
Syllabus / Topics	• Oxygen sensor • MAP sensor • MAF sensor
Practical Activities / Lab Work	• Test and simulate advanced sensors
Assessment Methods	CA 20% Practical 40% Exam 40%
Learning Outcomes	Service advanced automotive sensors.
Accreditation Mapping	NBTE NID ASE
AI/Future Module ↘	AI/IoT Sensor Cloud Platform

AGE 403 – CAN Bus & Automotive Networks

Credit Hours	2 (1T/1P)
Course Description	Basics of CAN, LIN, MOST networks.
Syllabus / Topics	• CAN • LIN • MOST protocols
Practical Activities / Lab Work	• CAN analyzer lab work
Assessment Methods	CA 20% Practical 40% Exam 40%
Learning Outcomes	Understand and troubleshoot automotive networks.
Accreditation Mapping	NBTE NID IMI-UK
AI/Future Module ↘	AI CAN Bus Simulator



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AGE 404 – Entrepreneurship in Electrical Services

Credit Hours	2 (1T/1P)
Course Description	Entrepreneurship in auto electrical services.
Syllabus / Topics	• Business setup • Marketing • Finance
Practical Activities / Lab Work	• Draft electrical service business plan
Assessment Methods	CA 20% Business Plan 40% Exam 40%
Learning Outcomes	Develop entrepreneurship skills in electrical services.
Accreditation Mapping	NBTE NID IMI-UK
AI/Future Module ↗	AI Market Analyzer

AGE E3 – Smart Electrical Systems in EVs (Elective)

Credit Hours	2 (0T/2P)
Course Description	Smart electrical systems in electric vehicles.
Syllabus / Topics	• EV power systems • Smart systems
Practical Activities / Lab Work	• EV smart system lab work
Assessment Methods	Project 100%
Learning Outcomes	Understand and design EV electrical systems.
Accreditation Mapping	NBTE Elective IMI-UK
AI/Future Module ↗	AI/VR EV Systems Trainer