

VOCATIONAL EDUCATION AND TRAINING AUTHORITY

COURSE CONTENT OUTLINES FOR AUTO ELECTRICAL

Structure Year: 2013

Level One

MODULE #: AE 101 MODULE TITLE: MAINTAINING SAFETY OF WORKSHOP AND SURROUNDINGS

UNIT #: 1.1 UNIT TITLE: MAINTAINING WORKSHOP SAFETY

#	CODE	ELEMENTS
1	1.1.1	Maintaining workshop safety rules
2	1.1.2	Maintaining workshop working environment
3	1.1.3	Maintaining personal safety

UNIT #: 1.2 UNIT TITLE: HANDLING ACCIDENTS AND INCIDENTS

#	CODE	ELEMENTS
1	1.2.1	Handle mechanical hazards
2	1.2.2	Handle Physical hazards
3	1.2.3	Handle chemical hazards
4	1.2.4	Handle electrical hazards
5	1.2.5	Maintain safety gears

UNIT #: 1.3 UNIT TITLE: HANDLING FIRE ACCIDENTS

#	CODE	ELEMENTS
1	1.3.1	Handle firefighting equipment and materials
2	1.3.2	Handling different types of fire

UNIT #: 1.4 UNIT TITLE: PERFORMING FIRST AID

#	CODE	ELEMENTS
1	1.4.1	Perform artificial respiration
2	1.4.2	Perform first aid to minor wound scalpels

MODULE #: AE 102 MODULE TITLE: PERFORMING PREVENTIVE MAINTENANCE OF TOOLS, MACHINES AND EQUIPMENT

UNIT #: 2.1 UNIT TITLE: CONDUCTING PREVENTIVE MAINTENANCE OF WORK TOOLS

#	CODE	ELEMENTS
1	2.1.1	Maintaining measuring tools
2	2.1.2	Maintaining general hand tools
3	2.1.3	Maintaining engine and engine accessory tools
4	2.1.4	Maintaining tire, wheel, hub, and brake tools
5	2.1.5	Maintaining electrical circuit and light system

UNIT #: 2.2 UNIT TITLE: MAINTAIN MACHINE

#	CODE	ELEMENTS
1	2.2.1	Maintaining power machines
2	2.2.2	Maintaining manual machines

MODULE #: AE 103 MODULE TITLE: PERFORMING BENCH WORKS

UNIT #: 3.1 UNIT TITLE: PERFORM CUTTING

#	CODE	ELEMENTS
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1	3.1.1	Perform straight sawing
2	3.1.2	Perform angular sawing
3	3.1.3	Perform chiseling
UNIT #: 3.2		UNIT TITLE: PERFORM FILING
#	CODE	ELEMENTS
1	3.2.1	Perform flat filing
2	3.2.2	Perform radii filing
3	3.2.3	Perform angle filing
UNIT #: 3.3		UNIT TITLE: PERFORM DRILLING
#	CODE	ELEMENTS
1	3.3.1	Perform hand drilling on plate
2	3.3.2	Carry out drilling on bench drilling machine
3	3.3.3	Counter bore drilled holes
UNIT #: 3.4		UNIT TITLE: PERFORM RIVETING
#	CODE	ELEMENTS
1	3.4.1	Perform manual riveting
2	3.4.2	Perform pop riveting
3	3.4.3	Perform pneumatic riveting
UNIT #: 3.5		UNIT TITLE: PERFORM THREADING
#	CODE	ELEMENTS
1	3.5.1	Carry out dieing
2	3.5.2	Carry out taping
UNIT #: 3.6		UNIT TITLE: PERFORM METAL FORMING
#	CODE	ELEMENTS
1	3.6.1	Bend flat materials
2	3.6.2	Bend round materials
MODULE #: AE 104		MODULE TITLE: PERFORM WELDING PROCESSES
UNIT #: 4.1		UNIT TITLE: PERFORM ARC WELDING
#	CODE	ELEMENTS
1	4.1.1	Perform down hand arc welding bead
2	4.1.2	Perform down hand V joint
3	4.1.3	Perform down hand butt joint
4	4.1.4	Perform down hand tee joint welding
UNIT #: 4.2		UNIT TITLE: PERFORM GAS WELDING
#	CODE	ELEMENTS
1	4.2.1	Use gas welding tools and equipment
2	4.2.2	Perform down hand butt joint

3	4.2.3	Perform down hand lap joint
4	4.2.4	Perform brazing

UNIT #: 4.3

UNIT TITLE: PERFORM SOLDERING

#	CODE	ELEMENTS
1	4.3.1	Carry out thin metal soldering

MODULE #: AE 105

MODULE TITLE: BUILDING SIMPLE ELECTRIC CIRCUITS

UNIT #: 5.1

UNIT TITLE: CONSTRUCT RESISTIVE CIRCUITS

#	CODE	ELEMENTS
1	5.1.1	Build single resistor circuit
2	5.1.2	Build series resistive circuit
3	5.1.3	Build parallel resistive circuit
4	5.1.4	Build combination circuit

UNIT #: 5.2

UNIT TITLE: CONSTRUCT CAPACITIVE CIRCUITS

#	CODE	ELEMENTS
1	5.2.1	Build single capacitor circuit
2	5.2.2	Build series inductive circuit
3	5.2.3	Build parallel capacitive circuits
4	5.2.4	Build combination circuit

UNIT #: 5.3

UNIT TITLE: CONSTRUCT INDUCTIVE CIRCUITS

#	CODE	ELEMENTS
1	5.3.1	Build single inductor circuit
2	5.3.2	Build series inductive circuit
3	5.3.3	Build parallel inductive circuit
4	5.3.4	Build combination circuit

UNIT #: 5.4

UNIT TITLE: CONSTRUCT RLC CIRCUIT

#	CODE	ELEMENTS
1	5.4.1	Build resistance and capacitance circuit
2	5.4.2	Build resistance and inductance circuit
3	5.4.3	Build resistance, capacitance and inductance circuit

UNIT #: 5.5

UNIT TITLE: MEASURE ELECTRIC QUANTITIES

#	CODE	ELEMENTS
1	5.5.1	Measure voltage in the circuit
2	5.5.2	Measure current in the circuit
3	5.5.3	Measure resistance in the circuit
4	5.5.4	Measure power in the circuit

MODULE #: AE 106

MODULE TITLE: BUILDING SIMPLE ELECTRONIC CIRCUITS

UNIT #: 6.1

UNIT TITLE: DETERMINE CHARACTERISTICS OF ACTIVE ELECTRONIC DEVICES

#	CODE	ELEMENTS
1	6.1.1	Test characteristics of diode
2	6.1.2	Test characteristics of transistors
3	6.1.3	Test characteristics of thyristors
4	6.1.4	Test characteristics of opto-electronic devices
5	6.1.5	Test characteristics of integrated circuits

UNIT #: 6.2

UNIT TITLE: BUILD RECTIFIER CIRCUITS

#	CODE	ELEMENTS
1	6.2.1	Build half-wave rectifier
2	6.2.2.	Build full-wave rectifier (centre tapped)
3	6.2.3	Build bridge rectifier
4	6.2.4	Build smoothing circuit

UNIT #: 6.3

UNIT TITLE: PERFORM MEASUREMENTS ON SIMPLE LOW/HIGH FREQUENCY CIRCUITS

#	CODE	ELEMENTS
1	6.3.1	Test low frequency circuit
2	6.3.2	Test high frequency circuit

UNIT #: 6.4

UNIT TITLE: TROUBLESHOOT ANALOGUE ELECTRONIC CIRCUITS

#	CODE	ELEMENTS
1	6.4.1	Troubleshoot stabilized power supply
2	6.4.2	Troubleshoot single stage transistor amplifier
3	6.4.3	Troubleshoot multi-stage transistor and amplifier

MODULE #: AE 107 MODULE TITLE: CARRYING OUT GENERAL MAINTENANCE ON ELECTRICAL AND ELECTRONIC SYSTEMS

UNIT #: 7.1

UNIT TITLE: MAINTAIN BATTERIES

#	CODE	ELEMENTS
1	7.1.1	Check electrolyte level
2	7.1.2	Check state of charge of battery
3	7.1.3	Perform battery charging

UNIT #: 7.2

UNIT TITLE: SERVICE ELECTRICAL AND ELECTRONIC CIRCUITS

#	CODE	ELEMENTS
1	7.2.1	Troubleshoot electrical and electronic circuits
2	7.2.2	Repair electrical and electronic circuits

UNIT #: 7.3

UNIT TITLE: SERVICE CONVENTIONAL IGNITION SYSTEMS

#	CODE	ELEMENTS
1	7.3.1	Diagnose ignition systems
2	7.3.2	Repair ignition system components

MODULE #: AE 108

MODULE TITLE: CARRYING OUT GENERAL VEHICLE SERVICES

UNIT #: 8.1

UNIT TITLE: SERVICE ENGINE LUBRICATION SYSTEMS

#	CODE	ELEMENTS
1	8.1.1	Change engine oil
2	8.1.2	Change engine oil filter

UNIT #: 8.2

UNIT TITLE: SERVICE FUEL SYSTEMS

#	CODE	ELEMENTS
1	8.2.1	Change fuel filter
2	8.2.2	Service air cleaner
3	8.2.3	Perform fuel system bleeding

UNIT #: 8.3

UNIT TITLE: SERVICE COOLING SYSTEMS

#	CODE	ELEMENTS
1	8.3.1	Check engine coolant
2	8.3.2	Replace fan belt
3	8.3.3	Check operation of thermostat
4	8.3.4	Service radiator
5	8.3.5	Service water pump

UNIT #: 8.4

UNIT TITLE: SERVICE TRANSMISSION SYSTEMS

#	CODE	ELEMENTS
1	8.4.1	Check clutch free play
2	8.4.2	Service gear box
3	8.4.3	Service propeller shaft
4	8.4.4	Service final drive and differential

UNIT #: 8.5

UNIT TITLE: PERFORM GREASING

#	CODE	ELEMENTS
1	8.5.1	Carry out chassis greasing
2	8.5.2	Lubricate door locks and hinges

MODULE #: AE 109

MODULE TITLE: REPAIRING WHEELS AND TYRES

UNIT #: 9.1

UNIT TITLE: REPAIRING TUBED TYRES

#	CODE	ELEMENTS
1	9.1.1	Replace worn tyre
2	9.1.2	Refill pressure and foam material in tyre
3	9.1.3	Perform tyre rotation

UNIT #: 9.2

UNIT TITLE: REPAIR TUBELESS TYRES

#	CODE	ELEMENTS
1	9.2.1	Repair tube tyre
2	9.2.2	Repair tubeless tyre

UNIT #: 9.3

UNIT TITLE: PERFORM WHEEL BALANCING

#	CODE	ELEMENTS
1	9.3.1	Carry out static balance
2	9.3.2	Carry out dynamic balance
3	9.3.3	Perform tyre rotation

UNIT #: 9.4

UNIT TITLE: SERVICE WHEEL HUBS

#	CODE	ELEMENTS
1	9.4.1	Service wheel hub components
2	9.4.2	Adjust wheel bearing taps play

MODULE #: AE 110

MODULE TITLE: REPAIRING HYDRAULIC BRAKE SYSTEM

UNIT #: 10.1

UNIT TITLE: SERVICE HYDRAULIC BRAKE SYSTEM COMPONENTS

#	CODE	ELEMENTS
1	10.1.1	Service master cylinder
2	10.1.2	Service wheel cylinder
3	10.1.3	Service brake booster
4	10.1.4	Perform air bleeding

UNIT #: 10.2

UNIT TITLE: SERVICE DRUM BRAKES

#	CODE	ELEMENTS
1	10.2.1	Check brake drum
2	10.2.2	Reline drum brake shoes
3	10.2.3	Adjust brakes
4	10.2.4	Perform facing of brake drums

UNIT #: 10.3

UNIT TITLE: SERVICE DISC BRAKES

#	CODE	ELEMENTS
1	10.3.1	Replace brake pads
2	10.3.2	Repair brake caliper
3	10.3.3	Perform facing of disc

Level TwoMODULE #: AE
201MODULE TITLE: MAINTAINING SUSPENSION
SYSTEM

UNIT #: 1.1

UNIT TITLE: REPLACE
SUSPENSION BUSHES

#	CODE	ELEMENTS
1	1.1.1	Replace spring bushes
2	1.1.2	Replace stabilizer bushes

UNIT #: 1.2

UNIT TITLE: REPLACE SUSPENSION SHOCK ABSORBERS

#	CODE	ELEMENTS
1	1.2.1	Replace telescopic shock absorber
2	1.2.2	Replace McPherson strut shock absorber

UNIT #: 1.3

UNIT TITLE: REPLACE STEEL SUSPENSION SPRINGS

#	CODE	ELEMENTS
1	1.3.1	Refit coil springs
2	1.3.2	Refit leaf springs

3	1.3.3	Refit torsion bars
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MODULE #: AE 202

MODULE TITLE: CARRYING OUT ENGINE MAINTENANCE

UNIT #: 2.1

UNIT TITLE: PERFORM ENGINE NON DESTRUCTION TESTS

#	CODE	ELEMENTS
1	2.1.1	Perform engine compression test
2	2.1.2	Perform cylinder leakage test

UNIT #: 2.2

UNIT TITLE: ADJUST VALVE CLEARANCE

#	CODE	ELEMENTS
1	2.2.1	Perform valve overlap adjustment method
2	2.2.2	Perform one to one valve adjustment method

UNIT #: 2.3

UNIT TITLE: CARRY OUT IGNITION TIMING

#	CODE	ELEMENTS
1	2.3.1	Perform spark ignition timing
2	2.3.2	Perform compression ignition timing

MODULE #: AE 203

MODULE TITLE: MAINTAINING STARTING SYSTEMS

UNIT #: 3.1

UNIT TITLE: SERVICE STARTING SYSTEMS

#	CODE	ELEMENTS
1	3.1.1	Troubleshoot starting system faults
2	3.1.2	Repair starting system faults
3	3.1.3	Troubleshoot pre-glow system faults
4	3.1.4	Repair pre-glow defective components

UNIT #: 3.2

UNIT TITLE: REPAIR STARTER MOTOR

#	CODE	ELEMENTS
1	3.2.1	Rectify pre-engaged starter motor
2	3.2.2	Rectify Inertial starter motor
3	3.2.3	Rectify Axial starter motor
4	3.2.4	Rectify co-axial starter motor

MODULE #: AE 204

MODULE TITLE: MAINTAINING CHARGING SYSTEM

UNIT #: 4.1

UNIT TITLE: SERVICE ALTERNATOR

#	CODE	ELEMENTS
1	4.1.1	Troubleshoot alternator faults
2	4.1.2	Repair alternator

UNIT #: 4.2

UNIT TITLE: SERVICE VOLTAGE REGULATOR

#	CODE	ELEMENTS
1	4.2.1	Rectify charging system
2	4.2.2	Repair charging system components

MODULE #: AE 205

MODULE TITLE: MAINTAINING LIGHTING SYSTEM

UNIT #: 5.1

UNIT TITLE: REPAIR HEAD LIGHT SYSTEMS

#	CODE	ELEMENTS
1	5.1.1	Perform head light aiming
2	5.1.2	Troubleshoot head light system
3	5.1.3	Repair head lights components

UNIT #: 5.2

UNIT TITLE: REPAIR TURN SIGNALS AND HAZARD LIGHTS

#	CODE	ELEMENTS
1	5.2.1	Check turn signals
2	5.2.2	Check hazard lights

UNIT #: 5.3

UNIT TITLE: SERVICE PARKING LIGHTS

#	CODE	ELEMENTS
1	5.3.1	Rectify light combined switch and relays
2	5.3.2	Replace defective side lamps and bulbs

UNIT #: 5.4

UNIT TITLE: SERVICE BRAKE LIGHT SYSTEMS

1	5.4.1	Check brake light switch
2	5.4.2	Troubleshoot brake light circuit

MODULE #: AE 206

MODULE TITLE: MAINTAINING ACCESSORIES, CIRCUITS AND COMPONENTS

UNIT #: 6.1

UNIT TITLE: SERVICE RADIO SYSTEMS

#	CODE	ELEMENTS
1	6.1.1	Diagnose radio faults
2	6.1.2	Repair radio faults and test radio

UNIT #: 6.2

UNIT TITLE: REPAIR AUDIO VISUAL (TV) SYSTEMS

#	CODE	ELEMENTS
1	6.2.1	Troubleshoot audio visual faults
2	6.2.2	Repair audio visual components

UNIT #: 6.3

UNIT TITLE: SERVICE DEFOGGERS

#	CODE	ELEMENTS
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#	CODE	ELEMENTS
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1	6.3.1	Troubleshoot defogger system faults
2	6.3.2	Repair defogger faults
3	6.3.3	Service electronic headed windshield

UNIT #: 6.4

UNIT TITLE: REPAIR AIR BAG CIRCUIT

#	CODE	ELEMENTS
1	6.4.1	Troubleshoot air bag circuit
2	6.4.2	Repair air bag components

UNIT #: 6.5

UNIT TITLE: RECTIFY ELECTRIC HORN SYSTEMS

#	CODE	ELEMENTS
1	6.5.1	Troubleshoot electric horn circuit
2	6.5.2	Repair electric horn components

UNIT #: 6.6

UNIT TITLE: RECTIFY WIPER AND WASHER SYSTEMS

#	CODE	ELEMENTS
1	6.6.1	Rectify washer motor
2	6.6.2	Trouble shoot wiper system
3	6.6.3	Repair wiper system components

MODULE #: AE 207

MODULE TITLE: MAINTAINING IGNITION SYSTEMS

UNIT #: 7.1

UNIT TITLE: RECTIFY CONVENTIONAL IGNITION SYSTEMS

#	CODE	ELEMENTS
1	7.1.1	Troubleshoot conventional ignition system
2	7.1.2	Rectify conventional ignition system
3	7.1.3	Perform ignition timing
4	7.1.4	Service magneto ignition system

UNIT #: 7.2

UNIT TITLE: SERVICE COMPUTERIZED IGNITION SYSTEMS

#	CODE	ELEMENTS
1	7.2.1	Troubleshoot computerized ignition system
2	7.2.2	Repair computerized ignition system components

UNIT #: 7.3

UNIT TITLE: SERVICE ELECTRONIC IGNITION SYSTEMS

#	CODE	ELEMENTS
1	7.3.1	Troubleshoot electronic ignition system
2	7.3.2	Repair electronic ignition system components

MODULE #: AE 208

MODULE TITLE: MAINTAINING ELECTRICAL FUEL SYSTEM

UNIT #: 8.1

UNIT TITLE: RECTIFY PETROL FUEL SYSTEM

#	CODE	ELEMENTS
1	8.1.1	Troubleshoot petrol fuel system
2	8.1.2	Repair electronic petrol fuel components

UNIT #: 8.2

UNIT TITLE: RECTIFY DIESEL ELECTRICAL FUEL SYSTEMS

#	CODE	ELEMENTS
1	8.2.1	Troubleshoot diesel fuel system
2	8.2.2	Repair electronic diesel fuel components

MODULE #: AE 209

MODULE TITLE: MAINTAINING EMISSION CONTROL SYSTEM

UNIT #: 9.1

UNIT TITLE: SERVICING CATALYTIC CONVERTER

#	CODE	ELEMENTS
1	9.1.1	Inspecting catalytic converter
2	9.1.2	Repairing catalytic converter

UNIT #: 9.2

UNIT TITLE: SERVICING OXYGEN SENSOR

#	CODE	ELEMENTS
1	9.2.1	Inspecting oxygen sensor
2	9.2.2	Replacing an oxygen sensor

UNIT #: 9.3

UNIT TITLE: REPAIRING MUFFLER AND PIPES

#	CODE	ELEMENTS
1	9.3.1	Repairing exhaust system components
2	9.3.2	Replacing exhaust system components