



**NIDA CORPORATION
COMPUTER ASSISTED INSTRUCTION**

LESSON AND OBJECTIVE LISTING

**Master Course Listing
Automotive**

2018-08-30

OBJECTIVE LISTING - Master Course Listing

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LESSON ID/TITLE

CARDS/KITS

MOD 61 - INTRODUCTION TO VEHICLE TECHNOLOGY

7021-112-130 Introduction to the Automobile	---
▪ Understand the history of the automobile.	
▪ Identify 9 of the many automobile systems.	
▪ Identify careers associated with the automobile.	
7021-112-160 Electrical Systems	---
▪ Identify an automobile battery.	
▪ Identify devices of the automobile.	
▪ Understand how the devices get electrical energy from the battery.	
▪ Understand that a computer can control some systems of the automobile.	
7021-112-190 Charging and Ignition Systems	---
▪ Understand how the alternator works to recharge the battery.	
▪ Understand how the ignition coil works to ignite the fuel in the engine.	
7021-112-220 Fuel Systems	---
▪ Understand how a carburetor functions.	
▪ Understand how fuel injection functions.	
▪ Understand how a turbocharger functions.	
7021-112-250 Engines	---
▪ Identify basic engine parts.	
▪ Understand how the engine functions.	
▪ Understand how engines are classified.	
7021-112-280 Cooling Systems	---
▪ Identify the parts of the automobile's cooling system.	
▪ Understand the function of the cooling system.	
7021-112-310 Hydraulic Systems	---
▪ Understand the automobile's braking system.	
▪ Understand the automobile's power steering system.	
7021-112-340 Air Conditioning and Heating Systems	---
▪ Identify the major parts of the air conditioning system.	
▪ Understand how the air conditioning system functions.	
▪ Identify the parts of the heating system.	
▪ Understand how the heating system functions.	
7021-112-370 Drive Train and Suspension	---
▪ Identify the parts of the drive train.	
▪ Understand the function of the drive train.	
▪ Identify the parts of the suspension.	
▪ Understand the function of the suspension.	
7021-112-400 Body Design	---
▪ Identify the automobile body parts.	
▪ Understand the function of the automobile body parts.	
▪ Identify the different options of an automobile.	
▪ Understand the capabilities of each option.	
7021-112-920 Introduction to Vehicle Technology Post-Test (Theory)	---

MOD 62 - INTRODUCTION TO AUTOMOTIVE ELECTRICITY

7021-212-130 Automotive Safety	---
▪ Identify safety habits associated with electrical and other equipment.	

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MOD 62 - INTRODUCTION TO AUTOMOTIVE ELECTRICITY (cont.)

- 7021-212-130 Automotive Safety (cont.)
- Identify hazards associated with the automobile.
- 7021-212-160 Metric Notation ---
- Convert decimal numbers to powers of ten and vice versa.
 - Convert decimal numbers to metric prefixes and vice versa.
 - Add, subtract, multiply, and divide powers of ten.
 - Add, subtract, multiply, and divide metric prefixes.
- 7021-212-190 Voltage, Current, and Resistance ---
- Describe an atom and its structure.
 - Define electric charge as it relates to electrons and protons.
 - Describe the law of electrostatic forces.
 - Define voltage and the volt as a unit of voltage.
 - Define the relationship between voltage and potential difference.
 - Define current and the ampere as the unit of current.
 - Describe a conductor and the behavior of electrons within a conductor.
 - Describe an insulator and the behavior of electrons within an insulator.
 - Identify the purpose of a resistor.
 - Identify the unit of resistance as the ohm.
- 7021-212-220 Switches and Protective Devices ---
- Identify the purpose of a switch.
 - Identify switch schematic symbols.
 - Describe single and double pole.
 - Describe single and double throw.
 - Identify the purpose of protection devices.
 - Identify a fuse and a circuit breaker.
 - Identify schematic symbols for fuses and circuit breakers.
 - Identify a fusible link.
- 7021-212-920 Introduction to Automotive Electricity Post-Test (Theory) ---

MOD 63 - AUTOMOTIVE TEST EQUIPMENT

- 7021-214-130 Introduction to Multimeters ---
- Describe the purpose of a multimeter.
 - Identify the quantities measured by multimeters.
 - Identify two types of multimeter displays.
 - Describe the four functional sections of the multimeter.
 - Describe the purpose of each functional section.
- 7021-214-160 Multimeter Use 701
- Understand the operation of a digital multimeter.
 - Understand the steps to make a proper measurement using a digital multimeter.
- 7021-214-190 Voltage Measurements 701
- Describe how to set up a multimeter to measure voltage.
 - Describe how to read a multimeter's display when measuring voltage.
 - Identify the precautions to observe when making voltage measurements.
 - Perform voltage measurements using a digital multimeter.
- 7021-214-220 Current Measurements 701
- Describe how to set up a multimeter to measure current.

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MOD 63 - AUTOMOTIVE TEST EQUIPMENT (cont.)

7021-214-220	Current Measurements (cont.)	
	▪ Describe how to read a multimeter's display when measuring current.	
	▪ Identify the precautions to observe when making current measurements.	
	▫ Perform current measurements using a digital multimeter.	
7021-214-250	Resistance Measurements	708
	▪ Describe how to set up a multimeter to measure resistance.	
	▪ Describe how to read a multimeter's display when measuring resistance.	
	▪ Describe the precautions to observe when making resistance measurements.	
	▪ Define power rating.	
	▪ Define tolerance.	
	▪ Identify number/letter codes.	
	▫ Perform resistance measurements.	
7021-214-280	Introduction to the Oscilloscope	707, 708
	▪ Describe the purpose of an oscilloscope.	
	▪ Identify the quantities measured by an oscilloscope.	
	▪ Describe single trace and dual trace oscilloscopes.	
	▪ Identify the four major functional sections.	
	▪ Describe the purpose of each control and switch.	
	▫ Set up an oscilloscope for normal operation.	
	▫ Use an oscilloscope to analyze a waveform.	
	▫ Measure voltage using an oscilloscope.	
7021-214-920	Automotive Test Equipment Post-Test (Theory)	---

MOD 64 - BASIC ELECTRICAL DC AND AC

7021-216-130	Ohm's Law and Power	701
	▪ Define Ohm's Law and describe how voltage, current, and resistance are related.	
	▪ Define power and describe how voltage, current, and Ohm's Law are related to power.	
	▫ Prove the Ohm's Law relationship of voltage, current, and resistance.	
7021-216-160	Series Circuits and the Automobile	702
	▪ Identify a simple series circuit.	
	▪ Understand basic principles of a series circuit.	
	▪ Verify that Ohm's Law applies to series circuits.	
	▫ Observe a working series circuit.	
	▫ Verify basic principles of a series circuit.	
7021-216-190	Parallel Circuits	703
	▪ Identify a parallel circuit.	
	▪ Recognize that the applied voltage is the same across each branch.	
	▪ Calculate current in each branch of a parallel circuit.	
	▪ Calculate total current from the sum of the individual branches of a parallel circuit.	
	▪ Calculate total resistance in a parallel circuit.	
	▫ Measure the applied voltage across each branch in a parallel circuit.	
	▫ Measure resistance in a parallel circuit.	
	▫ Measure current in a parallel circuit.	
7021-216-220	Series-Parallel Circuits	704
	▪ Identify a series-parallel circuit.	
	▪ Calculate total resistance in a series-parallel circuit.	

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MOD 64 - BASIC ELECTRICAL DC AND AC (cont.)

7021-216-220 Series-Parallel Circuits (cont.)	705
<ul style="list-style-type: none"> ▪ Calculate current in a series-parallel circuit. ▪ Calculate voltage drops in a series-parallel circuit. ▫ Measure resistance values in a series-parallel circuit. ▫ Measure current values in a series-parallel circuit. ▫ Measure voltage drops in a series-parallel circuit. 	
7021-216-250 Voltage Divider Circuits	705
<ul style="list-style-type: none"> ▪ Identify a voltage divider circuit. ▪ Identify a voltage divider as loaded or unloaded. ▪ Calculate loaded and unloaded voltage divider current, voltage, and resistance values. ▪ Calculate % regulation for a voltage divider circuit. ▫ Identify and measure various characteristics of a voltage divider circuit. 	
7021-216-280 Relay Operation	706
<ul style="list-style-type: none"> ▪ Describe the purpose and type of relays. ▪ Describe basic relay construction and operation. ▪ Describe the latched and time delay relay. ▫ Observe basic relay operation. ▫ Observe characteristics of a basic relay circuit. 	
7021-216-310 Alternating Current	---
<ul style="list-style-type: none"> ▪ Define alternating current. ▪ Identify an AC sine wave. ▪ Define frequency and cycle. ▪ Describe hertz. ▪ Determine the wavelength of a sine wave. ▪ Determine the period of a sine wave. 	
7021-216-340 Magnetism, Relays, and Meters	---
<ul style="list-style-type: none"> ▪ Define magnetism. ▪ Identify characteristics of magnets. ▪ Define laws of magnetic attraction and repulsion. ▪ Describe properties of magnetic lines of force. ▪ Define electromagnetism. ▪ Identify the characteristics of electromagnets. ▪ Describe the operation of a relay. ▪ Describe the operation of a magnetic circuit breaker. ▪ Describe the operation of a meter. 	
7021-216-400 Automotive Troubleshooting I	702, 703, 704
<ul style="list-style-type: none"> ▫ Recognize normal operation of a series circuit. ▫ Observe and isolate faults in a series circuit. ▫ Recognize normal operation of a parallel circuit. ▫ Observe and isolate faults in a parallel circuit. ▫ Recognize normal operation of a series-parallel circuit. ▫ Observe and isolate random faults. 	
7021-216-920 Basic Electrical DC and AC Post-Test (Theory)	---

MOD 65 - BASIC ELECTRONICS FOR AUTOMOTIVE

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MOD 65 - BASIC ELECTRONICS FOR AUTOMOTIVE (cont.)

7021-218-130 Inductor Operation	707
▪ Identify types of inductors.	
▪ Describe the current-opposing characteristic of an inductor.	
▪ Identify the unit of measure for inductance.	
▪ Identify characteristics of inductance.	
▪ Identify mutual inductance.	
▫ Examine characteristics of an inductor.	
▫ Examine common operations of an inductor.	
7021-218-160 Capacitor Operation	707
▪ Identify types of capacitors.	
▪ Describe charge and discharge.	
▪ Identify the schematic symbol for a capacitor.	
▪ Identify characteristics of capacitance.	
▪ Identify the unit of measure for capacitance.	
▫ Examine the circuit characteristics of a capacitor.	
7021-218-190 Diode Operation	708
▪ Identify the purpose of a diode.	
▪ Recognize diode schematic symbols and use reference designators.	
▪ Describe the uses of diodes.	
▫ Analyze diode characteristics in a circuit.	
7021-218-220 Transistor Operation	709
▪ Describe the purpose of a transistor.	
▪ Describe types of transistors.	
▪ Identify transistor schematic symbols.	
▪ Identify leads on transistors.	
▫ Analyze transistor characteristics in a circuit.	
7021-218-250 AND Gates	710
▪ Identify AND operation.	
▪ Identify AND logic symbols.	
▪ Identify AND logic schematic symbols.	
▪ Construct an AND gate truth table.	
▪ Identify inputs and outputs.	
▫ Measure input and output waveforms.	
7021-218-280 OR Gates	711
▪ Identify OR operation.	
▪ Identify OR logic symbols.	
▪ Identify OR logic schematic symbols.	
▪ Construct an OR gate truth table.	
▪ Identify inputs and outputs.	
▫ Analyze OR gate circuit operation.	
7021-218-310 NOT Gates	712
▪ Identify NOT operation.	
▪ Identify NOT logic symbols.	
▪ Identify NOT logic schematic representation.	
▪ Construct a NOT gate truth table.	
▪ Identify input and output waveforms.	
▫ Analyze NOT gate circuit operation.	

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MOD 65 - BASIC ELECTRONICS FOR AUTOMOTIVE (cont.)

7021-218-340 Introduction to Combinational Circuits	713B
▪ Define combinational logic.	
▪ Describe the uses of combinational logic.	
▪ Trace inputs through a combinational logic circuit.	
▪ Describe the universal property of the NAND gate.	
▪ Describe the universal property of the NOR gate.	
▫ Analyze the operation of a combinational circuit.	
7021-218-400 Automotive Troubleshooting II	706, 707, 708
▫ Recognize normal operation of a relay circuit.	
▫ Observe and isolate a faulted relay circuit.	
▫ Recognize normal operation of a diode circuit.	
▫ Observe and isolate a fault in a diode circuit.	
▫ Recognize normal operation of an inductive circuit.	
▫ Observe and isolate random faults.	
7021-218-920 Basic Electronics for Automotive Post-Test (Theory)	---

MOD 66 - BASIC AUTOMOTIVE SYSTEMS

7021-312-130 Turn Signal Systems	714
▪ Describe the use of the turn signal.	
▪ Examine the characteristics of turn signals.	
▫ Examine the operation of a turn signal system.	
7021-312-160 Starting Systems	715
▪ Describe the use of the starting system.	
▪ Examine the characteristics of different starting system components.	
▫ Examine the operation of a starting system.	
7021-312-190 Ignition Systems	707, 709
▪ Identify the components of a Distributor Ignition System.	
▪ Identify the types of ignition systems.	
▪ Identify the components of a Distributorless Ignition System.	
▪ Identify the benefits of Distributorless Ignition Systems.	
▫ Describe the operation of mechanical and electronic switching circuits.	
7021-312-220 Charging Systems	708
▪ Identify the components of a charging system.	
▪ Describe the characteristics of charging systems.	
▫ Examine the operation of diodes in a charging system.	
7021-312-250 Fuel Injection	716
▪ Describe the use of fuel injection.	
▪ Examine the characteristics of different types of fuel injection.	
▫ Examine the operation and timing of fuel injection in an automobile.	
7021-312-280 Engine Cooling and Climate Control	713A
▪ Identify the purpose of the engine's cooling system.	
▪ Describe the operation and construction of an engine's cooling system.	
▪ Describe the operation and construction of the cooling system's components.	
▪ Describe the operation of electrical circuits used to control the cooling system.	
▪ Identify the purpose of the environmental climate control system.	
▪ Describe the operation and construction of an environmental climate control system.	

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MOD 66 - BASIC AUTOMOTIVE SYSTEMS (cont.)

- 7021-312-280 Engine Cooling and Climate Control (cont.)
- Describe the operation and construction of the environmental climate control system components.
 - Describe the operation of electrical circuits used to control the climate control system.
 - Observe the operation of the circulating fan circuit in the air conditioning and engine cooling system.
 - Identify the faulty operation of the circulating fan circuit in the air conditioning and engine cooling system.
- 7021-312-400 Automotive Troubleshooting III 713A, 714, 715
- Recognize normal operation of AC and cooling fans.
 - Observe and isolate a faulted AC and cooling fan system.
 - Recognize normal operation of a blinker system.
 - Observe and isolate a fault in a blinker system.
 - Recognize normal operation of an inductive circuit.
 - Observe and isolate random faults.
- 7021-312-920 Basic Automotive Systems Post-Test (Theory) ---

MOD 67 - AUTOMOTIVE APPLICATIONS

- 7021-314-130 Trailer Wiring 720, 721
- Understand the kinds of problems associated with trailer wiring.
 - Understand the process of troubleshooting trailer wiring.
 - Describe the types of test instruments used to troubleshoot trailer wiring.
 - Define a short circuit.
 - Define an open circuit.
 - Perform a basic wiring exercise including continuity and acceptance testing.
 - Recognize common malfunctions in trailer lighting systems.
- 7021-316-130 Car Audio Systems ---
- Identify the components that make up a car audio system and describe their function.
 - Identify various car audio system components that adjust certain properties of the sound.
 - Identify the components that increase the sound level and convert the electrical signals to audible sound.
 - Understand the proper way to wire the audio system.
- 7021-316-160 Car Audio Design and Installation CAS1, CAS2, CAS3, CAS4(3)
- Describe the steps in designing a car audio system.
 - Determine the basic tools needed in order to upgrade a car audio system.
 - Understand the installation procedures.
 - Design an audio system by laying out all audio devices in a functional way.
 - Install the audio system by measuring the proper lengths of wire and connecting the devices correctly.
- 7021-316-920 Automotive Technology Car Audio Post-Test (Theory) ---

MOD 68 - AUTOMOTIVE CAN BUS

- 7021-412-130 CAN Bus Familiarization TS101 Set
- Examine CAN bus basics.
 - Describe CAN bus specifications.
 - Examine CAN bus automotive applications.

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MOD 68 - AUTOMOTIVE CAN BUS (cont.)

- 7021-412-130 CAN Bus Familiarization (cont.)
 - Describe OBDII error codes.
 - Test and confirm normal operation of a CAN bus system.
 - Perform measurements on the CAN bus circuitry.
 - Confirm normal operation of a CAN bus system.
 - Troubleshoot CAN bus circuitry.
- 7021-412-160 CAN Bus Power Distribution TS101 Set
 - Examine CAN bus power distribution basics.
 - Test and confirm normal operation of CAN bus power distribution circuitry as part of the CAN bus system.
 - Perform measurements on the CAN bus power distribution circuitry.
 - Confirm the normal operation of CAN bus power distribution circuitry.
 - Troubleshoot CAN bus power distribution circuitry.
- 7021-412-190 CAN Bus Engine TS101 Set
 - Examine CAN bus engine basics.
 - Test and confirm normal operation of CAN bus engine circuitry as part of the CAN bus system.
 - Perform measurements on the CAN bus engine circuitry.
 - Confirm the normal operation of CAN bus engine circuitry.
 - Troubleshoot CAN bus engine circuitry.
- 7021-412-220 CAN Bus Transmission TS101 Set
 - Examine CAN Bus transmission basics.
 - Test and confirm normal operation of CAN bus transmission circuitry as part of the CAN bus system.
 - Perform measurements on the CAN bus transmission circuitry.
 - Confirm the normal operation of CAN bus transmission circuitry.
 - Troubleshoot CAN bus transmission circuitry.
- 7021-412-250 CAN Bus Lighting-Security TS101 Set
 - Examine CAN Bus lighting and security basics.
 - Test and confirm normal operation of CAN bus lighting and security circuitry as part of the CAN bus system.
 - Perform measurements on the CAN bus lighting and security circuitry.
 - Confirm the normal operation of CAN bus lighting and security circuitry.
 - Troubleshoot CAN bus lighting and security circuitry.
- 7021-412-280 CAN Bus ABS/ESC/TC TS101 Set
 - Examine CAN Bus ABS/ESC/TC basics.
 - Test and confirm normal operation of CAN bus ABS/ESC/TC circuitry as part of the CAN bus system.
 - Perform measurements on the CAN bus ABS/ESC/TC circuitry.
 - Confirm the normal operation of CAN bus ABS/ESC/TC circuitry.
 - Troubleshoot CAN bus ABS/ESC/TC circuitry.
- 7021-412-920 Automotive Technology - CAN Bus Post-Test (Theory) ---

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