



Wayne County Community College District

COURSE SYLLABUS

AUT 116 Electrical/Electronic Systems III

CREDIT HOURS: 3.00

CONTACT HOURS: 60.00

COURSE DESCRIPTION:

This course is a required course in the Automotive Technology certificate and associate degree programs

PREREQUISITES: AUT 114, AUT 115

EXPECTED COMPETENCIES:

Upon completion of this course, the student will be familiar with:

Shop Safety

For every task in Electrical/Electronic Systems, the following safety requirements must be strictly enforced: Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

- **Identify protective clothing and equipment and their proper use; proper shop behavior; principles of fire safety; and federal regulations concerning hazardous material and shop safety.**

Objective

- Describe how to select individual personal protective clothing and equipment.
- Identify the dangers of improper behavior in the shop.
- Identify the importance of proper grooming and hygiene.
- Identify the classes of fires and the types of fire extinguishers.
- Identify the use of a fire blanket.
- Identify general fire emergency procedures.
- Identify the Occupational Safety and Health Administration (OSHA) regulations.
- Identify the Environmental Protection Agency (EPA) regulations.
- Identify the safe use of fire protection equipment
- Identify the safe use of shop equipment following Environmental Protection Agency (EPA) and Occupational Safety and Health Act (OSHA) regulations

- **Identify and explain the safe and proper use of chemicals**

Objective

- Identify the types and uses of solvents.
- Identify the types and uses of soaps and cleaning solutions.
- Identify the types and uses of oils.
- Identify the types and uses of greases.
- Identify the types and uses of specialty additives.



Wayne County Community College District

COURSE SYLLABUS

AUT 116 Electrical/Electronic Systems III

- Identify the types and uses of specialty chemicals.
- Describe the five general rules for using automotive chemicals.
- Complete the assignment sheet on lubricants.
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- Identify gasses and the hazards they present.
- Identify the hazards of asbestos dust.

General Electrical System Diagnosis

- **Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction. P-1**
 - Identify the procedures for verifying the customer's concerns.
 - Identify terms and definitions associated with the evaluation and diagnosis of electrical/electronic problems
 - Identify printed and electronic resources for automotive manuals, manufacturer and supplier updates.
 - Identify locations where vehicle identification numbers are found
 - Identify important diagnostic information included in driver complaints
- **Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action. P-1**
Objective
 - Identify the equipment used to test electrical circuits.
 - Identify the procedures for testing electrical circuits.
 - Identify the types of electrical faults.
 - Demonstrate the ability to:
 - A. Measure voltage in a circuit.
 - B. Measure resistance in a circuit.
 - C. Measure current in a circuit.
 - D. Determine circuit voltage and continuity using a test light
 - E. Perform a fault test.
 - F. Check continuity in automotive electrical circuits.
 - G. Check for opens, shorts, and grounds in an automotive electrical circuit
 - H. Measure resistance in an automotive electrical circuit.
 - I. Measure volts in an automotive electrical circuit.



Wayne County Community College District

COURSE SYLLABUS

AUT 116 Electrical/Electronic Systems III

J. Measure current in an automotive electrical circuit.

K. Inspect and service fusible links, circuit breakers, and fuses in an automotive electrical circuit.

L. Identify and interpret electrical/electronic system concern

Charging System Diagnosis and Repair

- **Perform charging system output test; determine necessary action. P-1**
Objective
 - Identify the procedures for testing the charging system.
 - Identify the procedures for determining the current requirements charging system.

- **Diagnose charging system for the cause of undercharge, no-charge, and overcharge conditions. P-1**
Objective
 - Identify the procedures for inspecting the charging system.
 - Identify the procedures for determining the current requirements of a charging system.

- **Inspect, adjust, or replace generator (alternator) drive belts, pulleys, and tensioners; check pulley and belt alignment. P-1**
Objective
 - Identify the procedures for removing the alternator.
 - Identify the procedures for installing the alternator.
 - Identify the procedures for servicing the alternator.

- **Remove, inspect, and install generator (alternator). P-1**
Objective
 - Identify the procedures for removing the alternator.
 - Identify the procedures for installing the alternator.
 - Identify the procedures for servicing the alternator.
 - Identify the procedures for servicing the voltage regulator.
 - Demonstrate the ability to:
 - A. Remove and install the alternator.
 - B. Service the alternator.
 - C. Service the voltage regulator.



Wayne County Community College District

COURSE SYLLABUS

AUT 116 Electrical/Electronic Systems III

- **Perform charging circuit voltage drop tests; determine necessary action. P-1**
Objective
 - Identify the terms and definitions associated with inspecting and testing the charging system.
 - Identify the procedures for inspecting the charging system.
 - Identify the procedures for testing the charging system.
 - Identify the procedures for determining the current requirements of a charging system.
 - Demonstrate the ability to:
 - A. Perform a preliminary inspection and test of the charging system
 - B. Diagnose the charging system for undercharge, no-charge, overcharge conditions.
 - C. Perform a charging system output test.
 - D. Perform an alternator full-field test.
 - E. Perform a voltage regulator cutout test.
 - F. Perform circuit resistance and voltage drop tests.
 - G. Determine the current requirements for a charging system.

Starting System Diagnosis and Repair

- **Perform starter current draw tests; determine necessary action. P-1**
Objective
 - Identify the procedures for testing the starting system.
 - Identify the procedures for bench testing a starter.
- **Perform starter circuit voltage drop tests; determine necessary action. P-1**
Objective
 - Identify the procedures for inspecting the starting system.
 - Identify the procedures for testing the starting system.
- **Inspect and test starter relays and solenoids; determine necessary action. P-2**
Objective
 - Identify the procedures for removing and installing a starter.



Wayne County Community College District

COURSE SYLLABUS

AUT 116 Electrical/Electronic Systems III

- **Remove and install starter in a vehicle. P-1**
Objective
 - Identify the procedures for inspecting the starting system.

- **Inspect and test switches, connectors, and wires of starter control circuits; perform necessary action. P-2**
Objective
 - Identify the starting system components.
 - Identify the procedures for inspecting the starting system.
 - Identify the procedures for testing the starter control circuit components.
 - Demonstrate the ability to:
 - Inspect the starting system and perform a current draw test.
 - Perform starter circuit voltage drop tests.
 - Test the starter control circuit components.

- **Differentiate between electrical and engine mechanical problems that cause a slow-crank or no-crank condition. P-2**
Objective
 - Identify the procedures for inspecting the starting system.
 - Identify the procedures for testing the starting system.
 - Identify the procedures for testing the starter control circuit components.
 - Demonstrate the ability to:
 - A. Inspect the starting system and perform a current draw test.
 - B. Perform starter circuit voltage drop tests.
 - C. Test the starter control circuit components.

ASSESSMENT METHODS:

Student performance may be assessed by examination, quizzes, case studies, oral conversation, group discussion, oral presentations. The instructor reserves the option to employ one or more of these assessment methods during the course.

GRADING SCALE:

90%-100% = A
80%-89.9% = B
70%-79.9% = C
60%-69.9% = D
<60% = E