AUTO 1167: Vehicle Electronics

A. COURSE DESCRIPTION

Credits: 5
Lecture Hours/Week: 3
Lab Hours/Week: 4
OJT Hours/Week: *.*
Prerequisites: None
Corequisites: AUTO 1010 and AUTO 1010
MnTC Goals: None

This course reviews the fundamentals of electricity and electronics as applied to the automotive industry. Topics addressed include the principles and theory of electricity, electrical terminology, electromagnetism; including motors and induction, the principles of semi-conductors, basic automotive computer operation, including the operation of sensor, output or control signals, and data communication circuits. Also included in this course is the performance of accurate electrical measurements using a Digital Multimeter (Volts, Ohms, Amps) and other appropriate tools; diagnosis and performance of electrical wiring repairs; and the understanding electrical system failures and basic diagnostic principles. Reading and interpreting vehicle service manual or electronic service information electrical wiring schematics will also be covered. (Prerequisites: None)(3 credits lecture/2 credits lab)

B. COURSE EFFECTIVE DATES: 01/13/2014 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Electrical Theory
2. Electrical Terminology
3. Electromagnetism and Induction
4. Electrical Circuit Design, Operation, and Troubleshooting (Series, Paralell, and Series Parallel)
5. Electrical Measurements
6. Common Automotive Electrical Components
7. Circuit Diagrams and Schematics
8. Semiconductors
9. Automotive Computer Systems
D. LEARNING OUTCOMES (General)
   1. Describe electricity and the characteristics of electricity.
   2. Define automotive related electrical terms.
   3. Accurately perform electrical measurements using a Digital Multi-meter (Includes voltage, amperage, resistance, frequency, and duty cycle).
   4. Perform Digital Multi-meter functions accurately (Includes diode test, continuity test, Min/Max & Peak Min/Max recording, internal fuse testing).
   5. Describe the interaction of electricity and magnetism.
   7. Identify, demonstrate and accurately measure basic electrical circuits using classroom electrical training boards. (Series, parallel, and series-parallel circuits).
   8. Accurately perform testing of automotive related semiconductor components.
   9. Identify and describe the different types of computer input (sensors) and output (controlled devices) circuits.
  10. Build, accurately measure, and demonstrate the ability to perform testing of simulated computer system input and output circuits using classroom electrical training boards.
  11. Demonstrate the ability to accurately locate, read, and interpret electrical wiring schematics.
  12. Show the ability to identify and repair vehicle wiring harnesses, terminals, and connectors meeting industry repair standards.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies
   None

F. LEARNER OUTCOMES ASSESSMENT
   As noted on course syllabus

G. SPECIAL INFORMATION
   None noted