AMST1112 - Automotive Electrical Fundamentals

Credits:	4 (2/2/0)
Description:	This course involves understanding Ohm's Law, multimeter usage, using electrical schematics, batteries, starting systems and charging systems. Students perform testing and repairs on electrical systems used in all aspects of vehicles.
Prerequisites:	• AMST1101
Corequisites:	
Pre/Corequisites*:	
Competencies:	1. Demonstrate knowledge of electrical series, parallel and series-parallel circuits using the principles of Ohm's Law. 2. Demonstrate the proper use of a multimeter measuring AC and DC voltage, voltage drop, resistance, frequency and current. 3. Use electrical diagrams to understand and troubleshoot power flow used to diagnose and repair electrical concerns. 4. Inspect, diagnose, repair and/or replace components, connectors, terminals, harnesses and wiring in electrical/electronic systems. 5. Understand battery internal design, usage and theory. Perform battery capacity, load and state of charge tests. 6. Perform starter current draw test and voltage drop test, inspect and test starter relays and solenoids, then determine needed action. 7. Demonstrate knowledge of cause and effects for shorts, grounds, opens and resistance concerns in electrical circuits. 8. Perform electric circuit load tests using appropriate devices to determine circuit integrity. 9. Demonstrate and apply knowledge of an automatic idle-stop/start-stop system. 10. Diagnose the cause(s) of excess key-off battery drain (parasitic draw) and determine action needed. 11. Identify safety precautions for high voltage systems on electric, hybrid, hybrid-electric and diesel vehicles. 12. Disassemble and reassemble starters, alternators and various related internal parts to understand the design and operation of the components.
MnTC goal areas:	None

Can be taking as a Prerequisite or Corequisite.

© 2026 Minnesota State Community and Technical College.
We reserve the right to periodically update information without notice.
The information in this publication should not be regarded as contractual in nature.