

Course Objectives/Course Outline
Spokane Community College

Course Title: Theory of Electronic Systems

Prefix and Course Number: AUTO 215

Course Learning Outcomes:

By the end of this course, a student should be able to:

- Have a basic working knowledge of electrical-electronic theory.
- Be familiar with repair and diagnosis procedures and equipment used to repair electrical accessories.

Course Outline:

- I. Electrical
 - A. Circuits
 1. types
 2. identification
 - B. Testing Equipment
 1. analog meters
 2. digital meters
 3. starting and charging equipment
 4. alternator test bench
 5. hand-held equipment
 6. voltmeter
 7. ohmmeter
 8. load testers
 9. short finders
 10. test lights
 11. lab scopes
 - C. Wiring Diagrams
 - D. Flow Charts
- II. Testing of General Electrical Systems
 - A. Electrical Circuits
 1. continuity
 2. voltage
 3. current flow
 4. shorts/grounds/feedback/opens
 5. parasitic loads
 6. fusible links
 7. circuit breakers
 8. fuses
 9. P.T.C. wire protection
 - B. Testing Equipment
 1. ohmmeters
 2. ammeters
 3. voltmeters
 4. test lights
 5. short finders
 6. lab scopes
- III. Batteries: Maintenance and Testing
 - A. Types

1. conventional
 - a. slow charge
 - b. fast charge
2. maintenance free
 - a. slow charge
 - b. fast charge
3. R.V., deep cycle, marine
 - a. slow charge
 - b. fast charge
- B. Battery Cables, Connectors, Clamps
 1. inspection/maintenance procedures
- C. Jump Starting
 1. jumper cables
 2. procedures
 3. safety
- IV. Starting System Testing
 - A. Starter Control Units
 1. switches
 2. connectors
 3. wires
 - B. Relays and Solenoids
 1. testing procedures
 2. diagnostic procedures, post-testing
 - C. Starter
 1. testing procedures
 2. diagnostic procedures, post-testing
- V. Charging Systems: Inspection
 - A. Alternators
 1. component test
 2. output test
 - B. Voltage Regulators
 1. testing procedures
 2. diagnostic procedures, post-testing
 - C. Related Wiring
 1. testing procedures
 2. diagnostic procedures, post-testing

- VI. Lighting Systems
 - A. Headlights, Parking Lights, Taillights, Backup Lights, Courtesy Lights
 - 1. diagnosis
 - a. dimmer switches
 - b. relays
 - c. sockets
 - d. connectors
 - e. bulbs
 - f. wiring
 - g. circuit diagrams
- VII. Gauges, Warning Devices, and Driver Information Systems
 - A. Testing of:
 - 1. abnormal/no readings
 - 2. circuit diagrams
 - B. Technical Manuals
 - C. Onboard Computer (BCM)
- VIII. Horn
 - A. Testing of:
 - 1. horn button
 - 2. horn relay
 - 3. connectors
 - 4. circuits
 - B. Wire Repair Conventional
 - 1. soldering
 - 2. taping
 - C. Weather Pak Connector Repair
 - 1. tools
 - 2. procedures
 - D. Toyota Wire Repair
 - 1. tools
 - 2. procedures
- IX. Testing Procedures of Accessories
 - A. Power Windows
 - B. Power Door Locks
 - C. Electronic Defogger
- X. Onboard Computer Systems Testing
 - A. Sensor Operations
 - B. Electrostatic Charges
 - C. Safety
 - D. Antistatic Straps

- XI. Gauges
 - A. Balancing Coil Type
 - 1. testing
 - B. Thermo Electric
 - 1. testing
- XII. Testing of Miscellaneous Accessory Equipment
 - A. Radios
 - 1. reception
 - B. Noise Suppression Components
 - C. Cigar Lighters
 - 1. fuses
 - 2. connectors
 - D. Power Doorlocks
 - 1. testing
 - E. Power Windows
 - 1. testing