Automotive Electronics
AMT-1295
3 Credits, 2 Class Hours, 3 Laboratory Hours
Instructor: Claude Whitaker

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Office: W-58 Phone: 353-3449
Hours M - T- W 7:00-3:00 R- 7:00-2:00 F- 8:00-12:00
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Textbook and Other Materials:
Automotive Technology 4th edition, James D. Halderman
Automotive Technology Curriculum University of Missouri-Columbia

Course Description

This is a continuation of AMT-1195. Topics include semiconductor devices with emphasis on the junction diode, the bipolar transistor; electro-mechanical devices, specifically the operation and fault diagnosis and repair of self-rectifying D.C. generators; cranking motors; mechanical and electrical testing equipment used to diagnose ignitions systems and to determine the general condition of the engine for GM vehicles. Prerequisite(s): AMT 1190

Course Outcomes:
Upon completion of this course, the student should be able to:

1. Correctly use hand-held electronic test equipment while performing on-the-car measurements for either voltage, current, or resistance (impedance).

2. Identify on-the-car examples of series and parallel circuits.

3. Solve series and parallel circuits for either voltage, current, or resistance (impedance).

4. Identify various transistors and transistors application.

5. Describe the basic types of solid state devices used in the automotive electrical system.

6. Describe the Strategy Based Diagnosis process.
Course Assessments:
The student will be required to pass a series of on-the-car hands-on tasks set by the NATEF task list. (Task VI. Electrical/Electronic) Evidence that the tasks have been met, the student will identify and interpret electrical/electronic system concern: determine necessary action. Research applicable vehicle and service information, such as internal engine operation, vehicle service history, service precautions and technical service bulletins. Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, calibration decals). Perform battery state-of-charge test; determine necessary action. Perform battery capacity test; confirm proper battery capacity for vehicle application; determine necessary action. Maintain or restore electronic memory functions. Inspect and clean battery cables, connectors, clamps and hold downs, repair or replace as needed. Start a vehicle using jumper cables and a battery or auxiliary power supply. Perform starter current draw tests; determine necessary action. Perform starter circuit voltage drop tests; determine necessary action. Inspect and test starter relays and solenoids; determine necessary action. Remove and install starter in a vehicle. Inspect and test switches, connector and wires of starter control circuits; perform necessary action. Differentiate between electrical/electronic and engine mechanical problems that cause a slow-crank or no-crank condition. Perform charging system output test; determine necessary action. Diagnose charging system for the cause of undercharge, no-charge and overcharge conditions. Remove, inspect and install generator (alternator). Perform charging circuit voltage drop test; determine necessary action. All these tasks will be observe by me on a one-on-one basic when in the shop.

Grading Policy:
Grading of class: Letter grade conversions:
Assignment /Lab Sheets 10% A (90-100)
Unit & Mid-Term Tests (4) 20% B (80-89)
Hands-on Components 40% C (70-79)
Final Test 30% D (60-69)

Lab Sheets are based on hands-on performance tasks per the GM Service Technical College and the NATEF task list.

NOTE: If the AVERAGE TOWARD FINAL GRADE is 90 or above (+ - assignments and lab sheets) you do not have to take the FINAL TEST.
If you have to take the FINAL TEST, the AVERAGE TOWARD FINAL GRADE and FINAL TEST are averaged for the FINAL LETTER GRADE.

Laboratory Guidelines
- Horseplay will not be tolerated
- When working under an automobile, you must use a creeper
- Use all hand or special tools properly
- Do not sit in an automobile unless you are making a check or test that requires you to
- Do not run the radio or change radio setting
- Do not move the seat unless necessary
- You must use fender covers when working under the hood
• Do not use any part of an automobile for a work bench
• Every automobile must have a work order on it
• Every automobile jacked up must have jack stands under it
• You must wear safety glasses when doing the following:
  Turning a drum/rotor    Balancing a wheel
  Grinding                  Drilling holes
  Re-facing a valve                Using a blow gun

Topics to Be Covered:

Fundamentals of Electricity, Magnetism and D.C. Current

Week 2 – Series D.C. Current
Week 3 – Parallel D.C. Current
Week 4 – Schematics and Diagnosis
Week 5 – Automotive Wire Repair
Week 6 – A. C. Current and Diode Theory
Week 7 – Transistor Theory/ Microprocessor Fundamentals and Strategy Based Diagnosis

Attendance Policy
A student is expected to attend all scheduled classes and laboratories. Each instructor will formulate an attendance policy and provide it on the course syllabus. Absences are counted from the first scheduled meeting of the class, and it is the responsibility of each student to know the attendance policy of each instructor in whose class he/she is enrolled. If a student is absent from a class, he/she should give an advanced explanation to the instructor. Absences in a course may affect a student’s final grade. The student is responsible for all assigned work in the course regardless of excused or unexcused absences. Tardiness may also affect a student’s final grade.
Failure to attend class will result in a final course grade of “FA” or “FN” (see explanation below) depending on the individual instructor’s course policy.
FA= failure, attendance-related (unofficial withdrawal) Last recorded date of attendance required.
FN= failure, never attended class (unofficial withdrawal)

Student Communication Channels
It is the student’s responsibility to check D2L and MyNSCC email on a regular basis. These are the official communication channels between the college and students. Students are responsible for the information communicated through those channels. D2L contains specific course information and MyNSCC contains information important for other purposes.
Early Warning System
Nashville State Community College has implemented an Early Warning System to notify students via e-mail about academic problems such as poor classroom attendance, poor performance on assignments/tests, poor communication skills, late/missing assignments, and/or lack of classroom participation. Please note that Early Warning Alerts do not affect a student’s academic standing.

ADA Compliance Statement
Nashville State complies with the Americans with Disabilities Act. If you wish to request any special accommodations for any courses in which you are enrolled, contact the Student Disabilities Office at 353.3721.

Classroom Misconduct
Nashville State Community College has a zero tolerance policy for disruptive conduct in the classroom. Students whose behavior disrupts the classroom will be subject to disciplinary sanctions. Please consult your Student Handbook for more specific details.
The instructor has primary responsibility for control over classroom behavior and maintenance of academic integrity. He/she can order temporary removal or exclusion from the classroom of any student engaged in disruptive conduct or in conduct which violates the general rules and regulations of the College.
Disruptive behavior in the classroom may be defined as, but is not limited to, behavior that obstructs or disrupts the learning environment (e.g., offensive language, harassment of students and professors, repeated outbursts from a student which disrupt the flow of instruction or prevent concentration on the subject taught, failure to cooperate in maintaining classroom decorum, etc.), the continued use of any electronic or other noise or light emitting device which disturbs others (e.g., disturbing noises from beepers, cell phones, palm pilots, lap-top computers, games, etc.).
Please be aware that children are not allowed in class or unattended on campus.

Academic Dishonesty (Honor Code)
Any form of academic dishonesty, cheating, plagiarizing, or other academic misconduct is prohibited. “Plagiarism may result from: (1) failing to cite quotations and borrowed ideas, (2) failing to enclose borrowed language in quotation marks, and (3) failing to put summaries and paraphrases in your own words (A Writer’s Reference 331). Academic dishonesty may be defined as, but is not limited to, intentionally trying to deceive by claiming credit for the work of another person, using information from a web page or source without citing the reference, fraudulently using someone else’s work on an exam, paper, or assignment, recycling your own work from another course, purchasing papers or materials from another source and presenting them as your own, attempting to obtain exams/materials/assignments in advance of the date of administration by the instructor, impersonating someone else in a testing situation, providing confidential test information to someone else, submitting the same assignment in two different classes without requesting both instructor’s permission, allowing someone else to copy or use your work, using someone else’s work to complete your own, altering documents, transcripts or grades, and forging a faculty/staff member’s signature.
In addition to other possible disciplinary sanctions that may be imposed through regular college procedures as a result of academic dishonesty the instructor has the authority to assign an “F” or a “Zero” for the exercise, paper, or examination or to assign an “F” for the course. Students may appeal through the appropriate college grade appeal procedures.

Inclement Weather Policy
In the event of an inclement weather event, check the Nashville State web site home page at www.nscc.edu for announcements on campus closures. Campus closures will also be announced on local television stations (channels 2, 4, 5, and 17).
When classes are cancelled, an online assignment will be posted in NS Online. Check your NS Online email for a message from your instructor regarding your online assignment requirements. Even though classes may be cancelled, some areas, i.e. Testing Center, may be open. However, you should check before commuting to campus.
The Vice President for Academic Affairs and the Director of Security are responsible for cancellation decisions during an inclement weather event for the Nashville State main campus and the Southeast campus. Cookeville, Waverly, and Dickson Campus Directors will make class cancellation decisions based on conditions in their respective areas. Decisions about class cancellations are based on actual conditions, not forecasts. The perspective used for making decisions is that of the college as an employer, not as a K-12 institution. Students should use their own best judgment in determining whether to report to campus during inclement weather when classes are not cancelled.

**NOTE:** This syllabus is meant simply as a guide and overview of the course. Some items are subject to change or may be revised at the instructor’s discretion. Each instructor will further clarify their criteria for grading, classroom procedures, attendance, exams and dates, etc. on his/her course syllabus.