

**SOUTHEAST COMMUNITY COLLEGE**  
**TRANSPORTATION OCCUPATIONS**  
**DIESEL-AG EQUIPMENT SERVICE TECH**  
**COURSE SYLLABUS**  
**October 16, 2020**  
[Syllabus Statements](#)

**I. CATALOG DESCRIPTION**

Course Number: AGST1130  
Course Title: Electrical Systems I  
Prerequisite(s): None

Catalog Description: The basic principles and applications of electric circuits, magnetism, and the safe use of a digital multi-meter when measuring volts, amps, ohms, circuit theory exercise with basic math skills will be used to understand Ohm's Law for series, parallel, and series parallel circuits. The design, construction, safe operation and testing of lead acid storage batteries and the basic principles of operation and safe procedures for testing and repairing of electrical charging circuits will be covered. Emphasis will be placed on the diagnosis, testing and repair of alternators, wiring, connections, gauges, sensors, and controls.

Credit Hour: 3.0  
Class Hours: 15  
Lab Hours: 90  
Total Contact Hours: 105

**II. COURSE OBJECTIVES:** *Course will:*

- A. Define laws associated with electrical/electronic circuits.
- B. Define laws associated with magnetism and electromagnetism.
- C. Teach how to safely operate a digital and analog meter to measure values present in an electrical circuit.
- D. Teach how to calculate circuit values using OHM's Law, Series and Parallel Circuit Laws.
- E. Define the purpose, construction, and operating theory of lead acid storage batteries.
- F. Teach how to perform maintenance, service, and testing procedures on a typical lead acid storage battery.
- G. Explain the theory of charging circuit operation.
- H. Perform testing, maintenance, and repair procedures per 1.2 manual.
- I. Teach how to read, comprehend, and perform technical manual procedures.
- J. Demonstrate knowledge of the theory of operation of generator regulators.
- K. Teach how to safely operate generator test stand and electrical instruments.
- L. Teach how to prevent battery explosions and acid exposure during testing and repair operations.

**III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES**

**A. STUDENT LEARNING OUTCOMES:** *The student will be able to:*

1. Read and comprehend technical information found in textbooks, manuals and operating instructions used in the classroom and lab.

2. Use basic hand tools to perform service and repair operations in the lab.
3. Use a digital and analog meter to perform tests on Series, Parallel, and Series Parallel Circuits in a safe, accurate and effective manner.
4. Analyze electrical circuits to identify variable values in any electrical circuit, using basic math skills and the fundamental laws associated with electrical circuits.
5. Operate a battery load tester and assorted battery service tools provide by SCC to test a lead acid storage battery.
6. Use hand and power tools and equipment in a manner conducive to safe shop operations.
7. Connect and operate alternator output tester and multi meters in a safe and effective manner.
8. Read, comprehend, and perform technical operations called for in the repair and testing manual.
9. Perform testing, maintenance, and repair procedures per 1.2 manual.

**B. GENERAL EDUCATION LEARNING OUTCOMES:**

**GELO #3: Critical Thinking & Problem Solving**

**Outcomes:**

1. Collect, identify, interpret and analyze data.
2. Synthesize information to arrive at reasoned solutions to problems.
3. Evaluate ideas presented in writing, medial, speech, or artistic presentations.
4. Evaluate the validity of arguments, alternatives, data, outcomes, and/or impacts of action.
5. Acquire and integrate knowledge and construct relationships across disciplines.

**IV. CONTENT/UNIT OF INSTRUCTION**

- A. Electrical fundamentals
- B. Electromagnetism
- C. Lead acid batteries
- D. Safe semi – conductor theory
- E. Alternator regulators

**V. INSTRUCTIONAL MATERIALS**

**Required Text(s):**

“Fundamentals of Service” – John Deere Chapters 1, 2, 3, 4 & 6

“Fundamentals of Service, Electrical/Electronics” – John Deere

**Other Resources:**

Delco Remy 1.2 Manual (provided by instructor)

Tech Sheets

Service Manuals

1<sup>st</sup> quarter tools

Safety glasses w/side shields (Z87 approved)

Leather work shoes

Pen & colored pencils

Remote start switch and test lead kit (purchase kit at SCC parts store)

Delco – Remy 1.2 Manual (provided by instructor)

**Outside Reading/Research Required:**

Three Technical Reports based on articles found in a trade journal related to Agricultural Transportation.

## **VI. METHODS OF PRESENTATION / INSTRUCTION**

### **A. Methods of presentation typically include a combination of the following:**

1. Lecture
2. Small and large group discussion
3. Video presentation
4. Transparencies
5. Demonstrations
6. Project boards
7. Flip charts
8. Handouts
9. Observations
10. Assigned lab projects
11. Field trips

## **VII. METHODS OF EVALUATION**

### **A. Methods of evaluation typically include a combination of the following:**

1. Notebook (if required)
2. Quizzes
3. Tests
4. Lab grades

Letter grades will be based on the SCC Standard Grade Scale Policy. **Note:** See course outline for specific details on how the course grades will be calculated.

## **VIII. SPECIFIC COURSE REQUIREMENTS**

### **A. Student must:**

1. Complete all tests, projects, assignments, and notebook (if required).
2. Earn a final grade of 70% (2.0) or higher.

### **B. Program shop safety rules will be followed. Please see the course outline for any additional safety rules established by the instructor.**

### **C. Perform necessary tool room duties.**

### **D. Attendance:**

1. Attendance is required for successful completion of this course.
2. Each instructor will inform students by means of a Syllabus and Course Information Document of attendance requirements at the first class meeting.
3. Students are expected to complete all assignments / homework by the assigned due date/time, and attend all sessions for class and lab.
4. It is expected that students will be on time and present for all scheduled class / lab times unless PRIOR arrangements have been made with the instructor.
5. Missed class or lab sessions, regardless of cause, reduces the opportunity for learning and may affect student learning outcomes and the student's grades.
6. Students are responsible for all content missed, regardless of the reason for the absence.
7. Whenever possible students must notify the instructor if unable to attend any class / lab session.

8. Emergency absences will be considered on an individual basis to determine if learning activities can reasonably be rescheduled during the current session.

**E. Participation:**

1. For every hour of classroom learning students are expected to perform two hours of related studies as homework or hands-on / simulated / on-line activities outside the classroom.
2. Students are expected to be responsible for meeting scheduled class / lab / homework & assigned due dates unless prior arrangements have been made with the instructor 24 hours before the due date.
3. Students are expected to complete all exams, quizzes, lab activities and assignments / homework at the scheduled times unless PRIOR arrangements have been made with the instructor before the due date and time.
4. When reasonably possible, and only when prior arrangements have been made, students may ask the instructor to have a test or exam rescheduled prior to 24 hours before the activities scheduled date and time.
5. Unscheduled Quizzes may be given at any time and may not be repeated or taken at a later time, unless approved by the instructor.
6. Exceptions due to emergency absences will be considered on an individual basis.