

SOUTHEAST COMMUNITY COLLEGE
TRANSPORTATION DIVISION
JOHN DEERE CONSTRUCTION & FORESTRY EQUIPMENT TECH
COURSE SYLLABUS
January 25, 2023

I. CATALOG DESCRIPTION

Course Number: JDCE1120
Course Title John Deere C&F Electrical/Electronics I
Prerequisite(s): None
Co-requisite(s): None

Catalog Description: This course contains basic electrical theory. The use of Ohm' Law with various types of electrical circuits will give an understanding of voltage amperage and resistance. The design and function of electrical and electronic components such as conductors, switches, relays, resistors diodes, transistors capacitors and transformers will be presented. The principles of magnetism and electromagnetic induction will be demonstrated. An introduction to electronic test meters for use in circuit failure identification and diagnostics along with the use of electrical circuit diagrams, schematics and symbols. Students will have the opportunity to work with and test basic electrical circuits. Safety when working with electricity and electrical systems will be practiced.

Credit Hours: 3.5
Class Hours: 23
Lab Hours: 90
Total Contact Hours: 113

II. COURSE OBJECTIVES: *Course will:*

- A.** Explain safety practices for working with electricity, electronics and their components.
- B.** Explain the basic theories of electron flow in an electrical circuit.
- C.** Explain Ohms Law, circuit types, and the relationship between voltage, amperage and resistance in electronic circuits.
- D.** Explain electrical units of measure.
- E.** Explain the characteristics of electrical energy, power and calculating watts.
- F.** Demonstrate the characteristics and use of magnetism, electromagnetism and electromagnetic induction.
- G.** Explain the characteristics of different materials that make conductors and insulators.
- H.** Explain how to identify wire by design, structure and size.
- I.** Explain different types of circuit protection devices and their importance in an electrical system.
- J.** Explain the design, and function of switches, relays, semiconductors, resistors, diodes, transistors, capacitors and transformers.
- K.** Explain how to use electrical symbols, circuit diagrams and schematics.
- L.** Provide the opportunity to use wiring diagrams, schematics and symbols.

- M. Demonstrate the use of electronic meters to measure voltage, amperage and resistance.
- N. Provide hands on experience measuring amperage, voltage and resistance in electrical circuits.
- O. Explain electrical system diagnostic procedures and how to identify different types of circuit failures.
- P. Provide the opportunity to build and test simple electrical circuits.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

A. STUDENT LEARNING OUTCOMES: *Student will be able to:*

1. Work safely with electricity and electronics.
2. Understand electron flow in an electrical circuit.
3. Use Ohms Law, and know the relationship between voltage, amperage and resistance in electronic circuits.
4. Identify different circuit types.
5. Use electrical units of measure.
6. Understand the characteristics of electrical energy and power.
7. Understand the characteristics and use of magnetism, electromagnetism and electromagnetic induction.
8. Identify materials that make good conductors and insulators.
9. Identify wire by design, structure and size.
10. Identify circuit protection devices and know their importance in an electrical system.
11. Understand the function of switches, relays, semiconductors, resistors diodes, transistors, capacitors and transformers.
12. Use electrical circuit symbols, diagrams and schematics.
13. Use electronic meters to measure voltage, amperage and resistance.
14. Use electrical system diagnostic procedures to identify different types of circuit failures.
15. Build and test simple electrical circuits.

B. GENERAL EDUCATION LEARNING OUTCOME:

GELO 3: Critical Thinking & Problem Solving

1. Collect, identify, interpret and analyze data.
2. Synthesize information to arrive at reasoned solutions to problems.
3. Acquire and integrate knowledge and construct relationships across disciplines.

IV. CONTENT/TOPICAL OUTLINE

- A. Safety practices for electricity and electrical systems
- B. Introduction to electricity and electron theory
- C. Ohm's Law, voltage, amperage and resistance
- D. Units of measure
- E. Electrical power and watts
- F. Electrical circuit types and structure
- G. Magnetism, electromagnetism and electromagnetic induction
- H. Conductors and insulators
- I. Wire characteristics, structure, design and identification
- J. Electrical circuit diagrams, schematics and symbols
- K. Electrical circuit protection
- L. Switches, lights and relays
- M. Semiconductors, resistors, diodes, transistors, capacitors and transformers
- N. Introduction to electrical test meters
- O. Measuring voltage, amperage and resistance

- P. Circuit failures. Opens, grounds, shorts and high resistance
- Q. Electrical system diagnostic procedures
- R. Building and testing electrical circuit labs

V. INSTRUCTIONAL MATERIALS

Required text(s): Service Advisor (made available in the classroom)
FOS Electronic and Electrical Systems

Other material(s): Required tool set, safety glasses (regulation Z87), leather shoes, John Deere uniform, colored pencils, notebook, writing instruments, calculator

VI. METHODS OF PRESENTATION/INSTRUCTION

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

1. Small and large group discussion
2. Video presentations
3. Demonstrations
4. Project boards
5. Flip charts
6. Handouts
7. Observations
8. 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
5. Reflection assignments

Grading will follow the SCC Standard Grade Scale Policy. See **Course Information Document** for specific details on how the course grades are calculated.

VIII. SPECIFIC COURSE REQUIREMENTS:

- A. Students must complete all tests, projects, assignments, and notebook (if required).
- B. Students must earn a final grade of 70% (2.0) or higher.
- C. Program safety rules will be followed. See the **Course Information Document** for any additional safety rules established by the instructor.
- D. Safety belts will be worn at all times, on or in any motorized vehicle, if equipped.
- E. Attendance and participation. See **Course Information Document** for attendance and participation policy.