

SOUTHEAST COMMUNITY COLLEGE
TRANSPORTATION DIVISION
JOHN DEERE CONSTRUCTION & FORESTRY EQUIPMENT TECH
COURSE SYLLABUS
December 12, 2022

I. CATALOG DESCRIPTION

Course Number: JDCE2450
Course Title John Deere C&F Advanced Machine Technology
Prerequisite(s): JDCE2350

Catalog Description: This course is a detailed focus on John Deere construction equipment systems specific to John Deere Crawler Dozers, Excavators, Motor Graders, Wheel Loaders, Backhoes, Skid Steers and Track Loaders. Topics include engine, powertrain, hydraulic, hydrostatic drive, electrical, electronic, and control systems. Hands on use of on-board machine monitors, display units, machine on-board diagnostic systems and Service Advisor will be used to perform interactive system testing, controller data monitoring, diagnostics and for performing system adjustments and calibrations. Service Advisor will be used to study diagrams, schematics and the theory of systems operations. Service Advisor will also be utilized to obtain system testing and adjustment procedures, system specifications and used to monitor and record system controller data streaming. Test meters and gauges will also be used for performing system tests and adjustments. Options and features specific to these machines will be discussed. Safe operation of machines and heavy equipment will be practiced.

Credit Hours: 6
Class Hours: 45
Lab Hours: 135
Total Contact Hours: 180

II. COURSE OBJECTIVES: *Course will:*

- A.** Explain machine specific engine systems design, functions, features and operation.
- B.** Demonstrate engine systems data monitoring, tests, adjustments, calibrations and diagnostic procedures.
- C.** Provide the opportunity to perform engine systems data monitoring, tests, adjustments, calibrations and diagnostic procedures.
- D.** Explain machine specific power train system design, functions, features and operation.
- E.** Demonstrate power train system data monitoring, tests, adjustments, calibrations and diagnostic procedures.
- F.** Provide the opportunity to perform powertrain system data monitoring, tests, adjustments, calibrations and diagnostic procedures.
- G.** Explain machine specific hydraulic system design, functions, features and operation.
- H.** Demonstrate hydraulic system data monitoring, tests, adjustments, calibrations and diagnostic procedures.
- I.** Provide the opportunity to perform hydraulic system data monitoring, tests, adjustments, calibrations and diagnostic procedures.

- J. Explain machine specific electronic control systems design, functions, features and operation.
- K. Demonstrate electronic control systems data monitoring, tests, adjustments, calibrations and diagnostic procedures.
- L. Provide the opportunity to perform electronic control systems data monitoring, tests, adjustments, calibrations and diagnostic procedures.
- M. Explain machine specific electrical system design, functions, features and operation.
- N. Present machine specific options and features
- O. Explain and demonstrate machine specific monitor and display unit functions and operation.
- P. Provide the opportunity to use machine monitors and display units for machine set-up, data monitoring, diagnostics, and systems calibrations.
- Q. Explain and demonstrate machine On Board Diagnostic system functions and operation.
- R. Provide the opportunity to use the On Board Diagnostic system for testing, adjusting, data monitoring and diagnostics.
- S. Explain and demonstrate On Board Systems calibrations.
- T. Provide the opportunity to use On Board System Calibrations to make hydraulic, power train, engine systems and electronic control systems calibrations.
- U. Demonstrate how to use Service Advisor for diagnostics, calibrations and data monitoring.
- V. Provide the opportunity to use Service Advisor for diagnostics, calibrations and data monitoring.
- W. Demonstrate how to use test equipment for diagnostics.
- X. Provide the opportunity to use test equipment for diagnostics.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

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

1. Perform engine systems data monitoring, tests, adjustments, calibrations and diagnostic procedures.
2. Perform powertrain system data monitoring, tests, adjustments, calibrations and diagnostic procedures.
3. Perform hydraulic system data monitoring, tests, adjustments, calibrations and diagnostic procedures.
4. Perform electronic control systems data monitoring, tests, adjustments, calibrations and diagnostic procedures.
5. Perform machine specific electrical system diagnostics and repairs.
6. Identify machine specific options and features.
7. Use machine monitors and display units for machine set-up, data monitoring, diagnostics, and systems calibrations.
8. Use On Board Diagnostic systems for testing, adjusting, data monitoring and diagnostics.
9. Use On Board System Calibrations to make hydraulic, power train, engine systems and electronic control systems calibrations.
10. Use Service Advisor for diagnostics, calibrations and data monitoring.
11. Use test equipment for diagnostics.
12. Operate machinery and heavy equipment as required for systems testing, adjusting, diagnostics and calibrations safely

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. Machine engine systems-Dozers, Excavators, Wheel Loaders, Motor Graders, Backhoes, Skid Steers, Track Loaders
- B. Machine power train systems-Dozers, Excavators, Wheel Loaders, Motor Graders, Backhoes, Skid Steers, Track Loaders
- C. Machine hydraulic systems-Dozers, Excavators, Wheel Loaders, Motor Graders, Backhoes, Skid Steers, Track Loaders
- D. Machine electronic control systems- Dozers, Excavators, Wheel Loaders, Motor Graders, Backhoes, Skid Steers, Track Loaders
- E. Machine electrical systems-Dozers, Excavators, Wheel Loaders, Motor Graders, Backhoes, Skid Steers, Track Loaders
- F. Machine options and features-Dozers, Excavators, Wheel Loaders, Motor Graders, Backhoes, Skid Steers, Track Loaders
- G. Machine monitor and display functions-Dozers, Excavators, Wheel Loaders, Motor Graders, Backhoes, Skid Steers, Track Loaders
- H. On Board Diagnostics and data monitoring-Dozers, Excavators, Wheel Loaders, Motor Graders, Backhoes, Skid Steers, Track Loaders
- I. On Board Systems calibrations-Dozers, Excavators, Wheel Loaders, Motor Graders, Backhoes, Skid Steers, Track Loaders
- J. Service Advisor
- K. Test equipment and diagnostics

V. INSTRUCTIONAL MATERIALS

Required text(s): Service Advisor (made available in the classroom)

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

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
6. Lab/classroom presentations

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.