SOUTHEAST COMMUNITY COLLEGE
TRANSPORTATION OCCUPATIONS
DIESEL-AG EQUIPMENT SERVICE TECH
COURSE SYLLABUS
November 17, 2022

I. CATALOG DESCRIPTION

Course Number: AGST2431
Course Title: Advanced Powertrains
Prerequisite(s): AGST1111, AGST1116

Catalog Description: Advanced study of power trains. Theory, design, construction, diagnosis, repair, and testing of ag equipment/off-highway power trains, particularly those transmissions classified as "on-the-go" shift types. CVT/IVT, powershift and shuttle shift style systems included.

Credit Hour: 6.0
Class Hours: 45
Lab Hours: 135
Total Contact Hours: 180

II. COURSE OBJECTIVES: *Course will*:

- **A.** Cover proper safety procedures related to the Hazard Communication and Globally Harmonized Systems as well as specific program rules for tool and equipment use.
- **B.** Cover operation of the vehicle in a safe and effective manner to move the machine for testing and placement in the service bay.
- **C.** Identify power train components and their functions.
- **D.** Cover theory, operation, proper diagnosis and repair of ag equipment power train systems.
- **E.** Demonstrate proper use of technical information found on dealer portals and technical manuals.
- **F.** Demonstrate use of common and special tools as prescribed in service information instructions.
- **G.** Cover analysis of common powertrain clutch pack, hydraulic, bearing, seal and gear failures.
- **H.** Demonstrate proper usage of powertrain diagnostic equipment.
- **I.** Demonstrate proper communication with instructors/customers throughout the process of service procedures.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

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

1. Perform safety procedures related to the Hazard Communication and Globally Harmonized Systems as well as specific program rules for tool and equipment use.
2. Identify power train components and their functions.
3. Test, diagnose, dissemble, evaluate, assemble, and verify correct operation of Ag equipment power train systems.
4. Describe power flow of power-shift / CVT transmissions.
5. Locate technical information found on dealer portals and technical manuals.
6. Operate the vehicle in a safe and effective manner to move the machine for testing and placement in the service bay.
7. Follow service manual / operator manual instructions for proper testing, diagnosis, disassembly, reassembly and verification of service performed.
8. Use common and special tools as prescribed in service manual instructions.
9. Describe the effects of common power-shift clutch pack, hydraulic, bearing, seal and gear failures.
10. Connect and interpret pressure gauges for measuring supply / return, clutch apply and lube circuits in Ag equipment power trains.
11. Communicate with customers throughout the process of service procedures.

B. GENERAL 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 actions.
5. Acquire and integrate knowledge and construct relationships across disciplines.

IV. CONTENT/UNIT OF INSTRUCTION

- **A.** Testing and diagnostic procedures
- **B.** Machine operation – Operator Manuals
- **C.** Failure analysis
- **D.** Shuttle shift transmission
- **E.** Powershift transmission
- **F.** IVT/CVT transmission
- **G.** Final drives
- **H.** Completion of all projects, assignments, and daily work sheets

V. INSTRUCTIONAL MATERIALS

Required Text(s): See Course Information Document for current textbook

Tools: See current required tool list

Other Materials: Students must use approved safety eyewear (Z-87.2) at all times while in the lab area (CLEAR LENS ONLY)
PPE – Personal Protective Equipment required by the program

Program or sponsoring employer shirt (button front or polo) no tee or sweat shirts.

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. Demonstrations
5. Project boards
6. Flip charts
7. Handouts
8. Observations
9. Assigned lab projects
10. Field trips

VII. METHODS OF EVALUATION

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

1. Quizzes
2. Tests
3. Lab grades
4. Class conduct

Letter grades will be based on the SCC Standard Grade Scale Policy. **Note:** See course information document 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 in all classes to progress through the program.

B. Attendance:

1. Attendance is required for successful completion of this course.
2. This is an Engaged Learning course and students are expected to complete pre-class preparation assignments/homework and attend sessions for class, lab, including assignments missed due to absence.
3. Each instructor will inform students by means of a Syllabus and Course Information Document of attendance requirements at the first-class meeting.
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 achievement of course learning outcomes and the student's grades.
6. Students are responsible for all content missed, regardless of the reason for the absence.

7. Students must, whenever possible, 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.

C. 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 and 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.

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