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

I. CATALOG DESCRIPTION

Course Number: AGST1261
Course Title: Powertrains & Hydraulic Systems
Prerequisite(s): AGST1111, AGST1116

Catalog Description: General shop safety and hazard communication. The theory, operation, diagnosis and repair of power transmission from the engine to the drive wheels, power take off and auxiliary drives. Includes inspection, adjustment, and reassembly of clutches and standard mechanical shift transmissions and differentials.
Introduction to hydraulic systems and symbols, theory, design, principles and applications of pumps, valves, actuators, reservoirs, lines, fittings, filters and fluids. Theory and function of open, closed, PFC, and combination systems. Safety, diagnostics, testing and repair of hydraulic systems and components. Service, repair, adjustment and troubleshooting of steering and braking systems used in modern ag equipment.

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

II. COURSE OBJECTIVES: *Course will:*

A. Cover power train components and their functions.
B. Cover theory and calculations of mechanical advantage of all simple machines.
C. Teach use of technical manuals and procedures.
D. Cover disassembly, inspection, adjustments and reassembly of a manual transmission.
E. Cover calculation of gear ratios for PTO and all transmission speeds.
F. Teach proper set up of drive pinion and ring gear for proper pinion depth, pinion preload, differential carrier preload and backlash.
G. Teach proper set up of endplay adjustment for transmission drive shaft and countershaft.
H. Cover theory and application of Pascal's Law.
I. Teach safety protocol when using components and fluids.
J. Cover theory, operation, diagnosis and repair of hydraulic systems.
K. Cover use and comprehension of hydraulic system schematics.
L. Cover hydraulic system preventive maintenance.
M. Teach operation of hydrostatic power transmission.

N. Teach proper use of diagnostic equipment in the diagnosis and repair of hydraulic systems.
O. Teach problem solving using hydraulic simulator.

III. STUDENT LEARNING OUTCOMES AND GENEARL EDUCATION LEARNING OUTCOMES

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

1. Safely handle and store hazardous materials found in the repair shop.
2. Use hand tools, measuring instruments, and special tools during transmission overhaul.
3. Identify parts using online parts and service information for ordering.
4. Read, comprehend and perform instructions and operations found in the technical manual.
5. Use hand tools to perform lab projects.
6. Safely operate test equipment.
7. Test, disassemble, measure and reassemble hydraulic components used in lab.

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

IV. CONTENT/TOPICAL OUTLINE

A. Safety
B. Clutches
C. Transmissions
D. Differentials
E. Hydraulic system design and operation
F. Seals
G. Pumps
H. Reservoirs
I. Filters
J. Valves and actuators
K. General maintenance
L. Steering and brakes
M. Use of testing and diagnostic equipment

V. INSTRUCTIONAL MATERIALS

Required Text(s): See Course Identification Document for current textbook.
Tools: See current required tool list.

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 & 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.