

Communicating Services – Sample Project

Purpose

A technician's primary role in the agricultural equipment industry is to repair equipment brought into a dealership. When customers bring equipment into a dealership, a complaint or concern is filed and provided to the technician. The technician's role is to find the problem, correct it, and communicate how they fixed it to the customer and the billing office. Communication includes the labor hours used and the parts replaced. Technicians use a *Work/Repair Order* to communicate these services to all parties involved.

The components of a work or repair order include the customer's complaint (or concern), the cause of the problem, the correction made, and a confirmation that the equipment is properly working. These sections are commonly referred to in the agricultural equipment and automotive industries as "The Four Cs." Typically, dealerships add a section to their order that communicates key parts replaced when repairing the equipment. Each work/repair order section aligns to a diagnostic step, as shown in Figure 1.


Diagnostic Process		Work/Repair Order
1. Verify the customer complaint		Complaint
2. Identify the symptoms		
3. Isolate the cause		Cause
4. List recommended repairs		Key Part
5. Repair the cause		Correction
6. Verify proper operation		Confirm

Figure 1. Diagnostic Process and Work/Repair Order

The technician's repair is unfinished until they submit a complete work/repair order. An incomplete or untimely order limits the dealer's ability to bill the customer properly. However, a proper order gives the customer confidence that their money is well spent on the services rendered.

How does a technician communicate repairs made on equipment to customers? How do technicians utilize a work/repair order?

Materials

Per group of four students:

- Power source
- LED
- (2) Wire with alligator clips
- Various tools and equipment to bug circuit

Per student:

- Safety glasses
- Pen
- *Work/Repair Order Template*

Procedure

Determine the components of a *Work/Repair Order*, then follow the steps, filling in the Four Cs to diagnose the cause to repair the circuit. Wear your safety glasses.

Part One – Identify Complaint/Cause

1. Acquire an assembled circuit and customer complaint from your instructor.
2. Read the complaint.
3. Summarize the complaint in the *Work/Repair Order Template*.
4. Diagnose the cause of the circuit failure and record it in the work/repair order.
5. Identify the key part that needs repaired or replaced in the work/repair order.
6. Describe the procedure used to correct the failure in the work/repair order.
7. Test the circuit again to confirm it works and the customer complaint has been satisfied. Write your confirmation in the work/repair order.
8. Trade your *Work/Repair Order* with a classmate as instructed by your teacher.

Part Two – Evaluate Work/Repair Order

Evaluate your classmate's *Work/Repair Order* using the *Work/Repair Order Rubric*. Record constructive and helpful comments for your classmate to edit their *Work/Repair Order*.

Part Three – Edit Work/Repair Order

Independently edit your *Work/Repair Order Template* and confirm that it meets the rubric's criteria. Then, submit your *Work/Repair Order* as instructed by your teacher.

Work/Repair Order Template

Customer Information

Name (Last, First)		Date	
Equipment			
Serial Number			
Drive Time/Mileage			

Complaint (Concern)

What is the customer's complaint? How did you verify the complaint?

Cause

What are the symptoms of the component failure? What is the root cause?

Key Part(s)

Part Number	Part Name	Quantity

Correction

What steps did you take to repair the problem?

Confirm

What steps did you take to confirm operation? What was the outcome?

Sample Teacher Notes

Students bridge what they learned during *Activity 1.2.1 Field Experience* to document the process using a Work/Repair Order. They work in a group of four to diagnose a pump failure and then work individually to write a repair order.

Teacher Preparation

Provide each group with a power source, cables with alligator clips, and an LED connected in a circuit. Bug each circuit, referencing the examples below. Students should diagnose the faults using the diagnostic process outlined in the *Purpose* and complete a *Work/Repair Order*.

Example Faults

- Use a dead battery.
- Add electrical tape or shrink-wrap to the battery's terminals to simulate battery corrosion.
- Place the alligator clips on the battery in position so they touch to short the electrical circuit.
- Another solution is to connect the two cables with another cable at the terminal (electricity follows the path of least resistance and not the pump).
- Add a diode into the circuit.
- Reverse the LED.

Student Performance

During Part One, students identify the complaint and the cause of the failure at their assigned circuit. They will correct and confirm that the circuit operates. A work/repair order will be completed by each student individually using the *Work/Repair Order Template*. Students trade their work/repair order with another student to be peer-edited with a *Work/Repair Order Evaluation Rubric* to complete Part Two. During Part Three, students complete the order to satisfy the *Work/Repair Evaluation Order Rubric* criteria.

Results and Evaluation

Evaluate students' work/repair orders using the *Work/Repair Order Evaluation Rubric*.

Sample Project

This sample is a modified version of *Project 1.2.4 Communicating Services* from the CASE 4 Learning *Ag Equipment Maintenance and Technology (AEMT)* curriculum. For more information about the course visit www.case4learning.org. The sample has been modified for time and material simplification to fit a workshop format and is not for resale or profit. Teachers are permitted to use this sample in their classroom without certification.

Contact **CASE 4 Learning** to receive permission to use this sample at a teacher professional development.

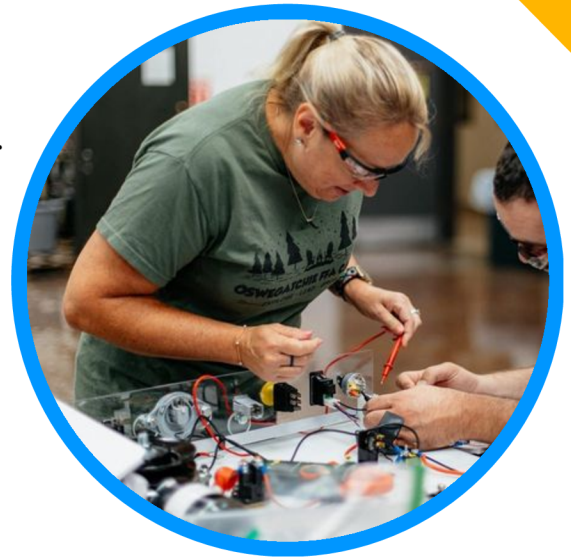


AGRICULTURAL EQUIPMENT MAINTENANCE & TECHNOLOGY

Course Description

Agricultural Equipment Maintenance and Technology (AEMT) is a course designed to prepare students with the skills needed to enter the career field as an agricultural technician. Throughout the course, students develop a technician's troubleshooting mindset through rigorous hands-on experiences in the classroom and laboratory.

In partnership with Associated Equipment Distributors Foundation (AEDF), AEMT is recognized as a program that teaches students skills needed to jumpstart their careers in the equipment industry. Each school can receive guidance and support by partnering with a local equipment dealer through the AEDF High School Recognition program.



Equipping teachers

- Specialization level
- Full year course
- Inquiry and project-based instructional practices
- CASE Institute professional development

Engaging students

- ✔ Operate tools to identify and fix equipment failures
- ✔ Complete work orders and journal tasks and observations.
- ✔ Use the diagnostic process to identify equipment failures and corrections.
- ✔ Use science, technology, engineering, and math to solve industry-based problems
- ✔ Demonstrate relevant personal and shop safety practices.

Instructional Units

- Agricultural Equipment
- Drive Systems
- Precision Agriculture
- Electrical and Digital
- Diesel Systems
- Hydraulics
- Partnering in the Field



Flexibility & Adaptability

CASE provides a comprehensive professional development experience, in addition to a work-life balance so teachers can best educate their students. Course work is adaptable and customizable based on teacher preference to fit all geographies and communities.

“The AEMT curriculum has allowed me to prepare my students to better understand electrical, hydraulic, and diesel fuel systems including CAN bus. It allows me to teach high level concepts on an Ag Teacher's budget. I believe it is the best curriculum available for teaching these concepts.”

- Mark Meyer, Kansas



scan or visit case4learning.org

This course is correlated to G-W Heavy Equipment Powertrains and Systems text



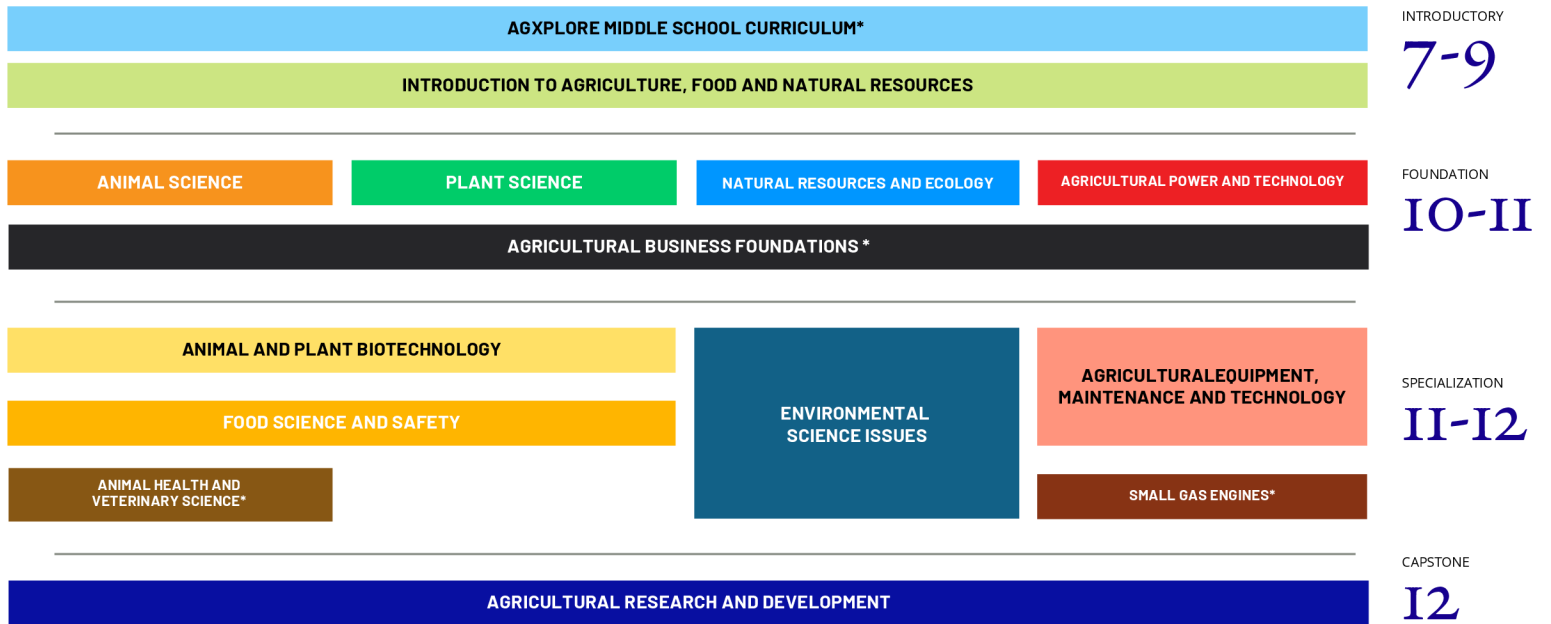
Equipping Teachers Engaging Students



Purposeful Curriculum

CASE has sequenced courses at four levels that enhance the delivery of agricultural education through inquiry-based learning and technical skills.

Courses and Instruction Levels



Mission

To design industry-leading, inquiry-based curriculum and teacher education to create lifelong learners and prepare students for the future of agriculture.

Standards Aligned

CASE develops curriculum with industry feedback and aligns courses to National Agriculture, Food, & Natural Resources and Career & Technical Education standards.

Professional Development and Lifetime Certification

CASE 4 Learning enhances agricultural education with inquiry and project-based learning to prepare the next generation of the agricultural workforce through teacher certification and professional development.

CASE Institutes

Professional development events preparing teachers to implement full-year CASE courses. Institutes provide teachers the content and skills needed to use CASE curricula in their classroom. CASE Institutes range from five to eight days in a hybrid, in-person, or virtual format.

BriefCASEs *

Professional development for shortened CASE courses or modules. BriefCASEs range from one to three days.

Grants & Scholarships

Corporate sponsors and donors throughout the agriculture industry support CASE teachers through funding material implementation grants and professional development scholarships. Teachers are eligible to apply in the fall to fund their programs in the following year.

Certification

Once the teacher is certified by attending a CASE Institute or BriefCASE, they have lifetime access. There are no subscriptions or renewal fees!



In-Person

Teachers attend the entire training at the host site.



Virtual

Teachers attend the entire training online. Teachers will receive materials via mail, and are responsible for their lab space.



Hybrid

Teachers receive training both virtually and in-person based on the course.