

## Agriculture Technical and Mechanical Systems CDE

Sunday, May 3, 2026

Wamego High School

Check-In: 2:30 – 3:00 PM

Event Time: 3:00 – 7:00 PM

Coordinator: Mark Meyer, - [mark.meyer@case4learning.org](mailto:mark.meyer@case4learning.org)

### Safety

- By registering students in this event, you as an instructor, verify that they have passed a local safety examination during the 2025-26 school year. Students not locally certified for shop safety **should not participate** in this CDE.
- **Student attire:** Closed toed shoes or boots, long pants, and a long shirt or welding jacket
- **Safety glasses:** Students not wearing safety glasses and proper PPE during practicums will receive zeros and may not be allowed to participate.

### General Information

#### *Team Information*

- 4 team members, all scores count
- Team activity only counts for **team** score
- Students can have cell phones with them – but they should not be out at any time.

#### *Attire*

- Safety glasses: clear style B – Z87
- Welding attire: Closed-toed shoes or boots, long pants, long shirt or welding jacket

#### *Required Materials (each participant)*

- Clipboard
- Pencils
- Calculator – non-programmable
- Welding gloves
- Tape measure

#### *Provided Materials*

- Welding helmet (can bring your own if desired)
- Digital multimeters at applicable stations (provided by SurePoint Ag)
- Tape measures – fractional inch division

### Team Practicum – 200 points

- Students will work as a team to construct a small concrete project using wood forms.
- Teams will be evaluated for working together, safety, and following a logical procedure.
- Teams will be required to calculate materials and costs for the project as well as complete a written report on procedure
- Teams should provide the following materials for the team activity: Two 1" x 6" x 6' boards, One 1" x 8" x 8' board, One 2' x 6" x 14" board (minimum lengths)
- - **Team Scoring**
    - Teamwork process and safety – 50 points
    - Team report – 25 points
    - Finished product – 125 points

## Individual Practicums

### *Written Examination (100 points)*

- 25 questions (multiple choice)
- Five questions from each event area. Some may involve math calculations.
- Students need a non-programmable calculator
- Unit conversions provided

### *Structures (50 points)*

- GMAW Welding
  - Demonstrate skills to produce a weldment according to a print
  - Interpret information from a print including weld symbols
  - Calculate material cost from a print or a list of materials
  - Weldments to be completed in flat, horizontal, or vertical plane with .035 wire and C-25 gas
  - Demonstrate basic measuring skills with a tape measure in fractional inches

### *Electrical (100 points)*

- DMM readings on electrical components from ag equipment – DC based on voltage, resistance, amperage, and continuity.
- DMM provided by SurePoint Ag
- Amp Clamp DMM – provided by SurePoint Ag
- Problem-solving questions. Read two problem scenarios and refer to a manual to identify the problem. Problems relate to electrical readings in ag equipment.

### *Natural Resources Practicum (100 points)*

- Interpret legal land descriptions and determine land area
- Calculate irrigation losses from various types of irrigation methods, flood, center pivot, drip, etc
- Select proper size emitters for a drip irrigation system based on area, spacing, flow rate, etc.
- Understand impact, benefits, and crop management of cover crops in agriculture crops.

### *Compact Equipment (100 points)*

- Use precision measuring tools to determine wear or size (dial caliper, micrometer, feeler gauge)
- Identify common small engine parts and tools including specialized tools for small engine repair.
- Find engine specifications or reject sizes for specific engine models from a service manual.
- Identify potential causes for small engine problems provided a description or illustration of symptoms.

### *Machinery and Equipment - Hay Balers - (100 points)*

- Identify parts and operation of a round baler.
- Perform a safety inspection and identify possible safety features for a baler.
- Match the proper size of tractor to the baler.
- Inspect power transmission parts and adjust to proper operating specifications from the owner's manual

## Resources

- Agriculture Mechanics Fundamentals and Applications, 7<sup>th</sup> Edition
- How to Read Shop Drawings, Lincoln Electric
- [Fluke Digital Multimeter Basics Online Course](#)
- Briggs & Stratton Engine Manuals
- [Small Engine Troubleshooting Tips](#)
- Major Engine Failure Analysis pdf - [Link](#)
- Use of Cover Crops in Agriculture – [ANR-57](#)
- [Subsurface Drip Irrigation for Turf](#)
- Management Tips for Round Hay Bales – KSU Extension – [Link to article](#)
- Quikrete Training Module – [Link](#) also information from the website

## Tiebreakers

- Team – Ties will be broken in this order:
  1. Team event score
  2. Team test score
  3. Highest individual drop score
- Individual – Ties will be broken in this order:
  1. Individual test score
  2. Highest practicum score (from all five areas)
  3. Individual welding score