

# AGRICULTURAL TECHNOLOGY AND MECHANICAL SYSTEMS

## 3 or 4 Member Team

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### I. PURPOSE

Technological advances in America continue to influence the way students must prepare for their futures. Students entering the workforce need a strong knowledge base and the ability to comprehend the interaction of complex systems. Students with these skills and abilities are more competitive in the job market, receive financial rewards and are selected for advancement. An agricultural mechanics education is comprised of strong technical content and complimented by the development of practical, hands-on skills. The subject matter areas and skill development practices have been grouped into five 'systems' areas, common to agriculture mechanics. Each agricultural mechanics activity is in response to a problem or need encountered in the workplace. The solving of such problems is dependent upon how each decision or solution, imposed on one component, will influence the other system components. The Texas FFA Agricultural Technology and Mechanical Systems Career Development Event recognizes students with agricultural mechanics competencies important to the modern workplace.

### II. EVENT FORMAT

#### Team Make-Up

1. Teams shall consist of three or four members. Team ranking is determined by combining the scores of the top three students from each team.

#### Equipment

##### 1. Needed- Material

Each event participant must adhere to the safe practices and work habits appropriate when performing required activities. Participants are responsible and must provide all personal safety equipment including:

##### a. Industrial-quality eye protection

INDIVIDUALS MUST WEAR STYLE B (SEE BELOW) INDUSTRIAL-QUALITY EYE PROTECTION during the team activity and the skill/problem solving activities. Those with prescription eyewear that is not Style B must also wear safety glasses or goggles while participating in this event. Safety glasses do not have to be worn while completing the written exam. Acceptable spectacles or goggles must adhere to the American National Standard Practice for Occupational and Education Eye and Face Protection, Z87.1-1979 (or Z87.1-1968) and revisions approved by ANSI. Descriptions of style A, B, and C Industrial Quality Eye Protection are as follows:

**Style A. NOT ACCEPTABLE for use in the event.** These are safety spectacles without side shields. They are for limited-hazard use requiring only frontal protection. The addition of accessory side

shields that are not firmly secured does not upgrade style A to a style B or C. **Style B.** Safety spectacles with wire mesh, perforated plastic or non-perforated side shields. The side shields shall be tapered, with an anatomical periphery extending at least halfway around the circumference of the lens frame. Industrial-quality eye protection for those not wearing prescription glasses shall be style B. **Style C. is NOT ACCEPTABLE for use in the event.** Safety spectacles with semi- or flat-fold shield that must be firmly secured to the frame. style C glasses do not provide maximum protection from the top and bottom angles.

**b. Clothing**

Each individual shall furnish and wear appropriate clothing such as long pants and long sleeved cotton shirt, coveralls, etc. for this event. Clothing must be in good repair and fit properly. Oversized or loose fitting clothing is dangerous around agricultural equipment and is not allowed. Long-sleeves must be worn when welding or oxy-fuel cutting.

**c. Other Materials**

Team members must provide their own compliant transparent plastic clipboard and/or clean folder with the following items: scan sheet, and/or copy of the scan sheet, optional Texas FFA CDE drop sheet, and/or 2 sheets of lined or unlined blank paper. Each participant must have two sharpened No. 2 pencils and an electronic calculator. Calculators used in this event should be battery operated and silent. Graphing calculators will be provided when necessary. Each participant must also provide an original Ag Sales/FB Mgmt./Ag Mech scan sheet (available on [judgingcard.com](http://judgingcard.com)). All other written materials will be furnished for the career development event.

**d. Computers**

Personal computers may be provided for problem solving activities.

**2. Provided- Specialized safety equipment**

- a. Necessary equipment such as helmets, shields, gloves, welding leathers, hearing protection devices, etc., will be provided by the Texas FFA Agricultural Technology and Mechanical Systems Committee service providers, unless prior notice is given.
- b. All tools and equipment will be furnished for the event. Individuals are allowed to use only the tools and equipment furnished by the state event committee.
- c. If a team member needs modified equipment due to physical size and stature, the student must supply this equipment. The team member or coach must present the student supplied equipment to the event superintendent prior to the start of the event for approval. Team members who need specialized or modified equipment due to disability as defined by the American Disabilities Act must submit the appropriate special needs request form and documentation with the team's certification form.

### C. Event Areas

The Texas FFA Agricultural Mechanics Career Development Event is divided into the following five systems areas. Each system includes a broad range of information and performance skills common to agricultural technology and mechanical systems.

- ~~1. Machinery and Equipment Systems: Application and equipment calibration, nozzle selection, equipment testing and maintenance.~~
- ~~2. Electrical Systems: Electronic sensing devices, multi-meters, relays, switches, magnetic motor controllers, motor selection, electrical trouble shooting.~~
- ~~3. Energy Systems: Power requirements, variable rate applications, electronically controlled equipment, valves, pumps, pressure regulators.~~
- ~~4. Structural Systems: Storage, mixing and loading requirements, fire safety, temperature control, ventilation, construction requirements, fabrication~~
- ~~5. Environmental and Natural Resources Systems: Pesticide and pesticide container disposal, pesticide handling, drift control, impact on non-target plants, animals and insects.~~

#### ***Event Areas Updated to reflect National Contest***

1. Machinery and Equipment: Repair and maintenance, materials handling, processing, adjustments, metal fabrication.
2. Electricity: AC/DC power, electrical safety, electrical standards, sensing devices, electrical wiring, controls, electronics, motors and other electrical load, operating instructions, and manufacturers recommendations.
3. Compact Equipment: Mechanical power, electrical power, hydraulic power, engine operation, maintenance, trouble-shooting, repair.
4. Structures: Structures, storage, concrete, masonry, plumbing, electrical, fabrication, construction, building materials, ventilation, heating, air conditioning.
5. Environment and Natural Resources: Water quality, sustainable agricultural practices, soil and water conservation, surveying, biological waste handling.

### D. Team Activities

The individuals on each team will work together and be evaluated as a team while solving complex, multi-system agricultural problems. The problem scenario is presented to the team on the day of the events and members utilize the materials and equipment provided to undertake and prepare a written, computer mechanics generated solution. Teams organize themselves, assigning duties and completing tasks together or separately depending on individual skills and abilities. Each team receives a score, and each team member receives one-third of the total team score.

### E. Individual Activities

## 1. Individual problem solving and skill development activities

Each student is individually evaluated in each of three systems areas. The specific activities occurring in each event are not publicized prior to the event. Each student is allowed 20 minutes to complete each of the three activities (60 minutes total).

## 2. Written examination

Each student completes an examination that consists of 100 multiple-choice questions. There are 33 questions from each of the three agricultural mechanics systems areas. Students will have 60 minutes to complete this portion of the career development event.

- F. ~~Schedule of Theme Announcement~~ Agricultural mechanics theme for the career development event will be selected one year in advance. This information is published and distributed through the National FFA Organization, and posted at <http://web.missouri.edu/~pavt0689/natcon.html>, the agricultural technology and mechanical systems web site. The theme for each year will be determined by the National FFA Agricultural technology and mechanical systems Career Development Event Committee. The event superintendent will notify the National FFA Program Manager for Career Development Events of the theme selected for the next year's event following the completion of the current year's event.

~~The specific theme for each year is posted on the National Agricultural Technology and Mechanical Systems CDE web site during November of the previous year and information specific to each year's event is updated periodically throughout the year. Updates generally occur during June and August. The schedule for announcing event information and details on equipment selection is governed by equipment availability and late changes by equipment manufacturers, dealers and contributors. It is the committee's hope that the theme examples listed below will provide direction for students and their advisors. This short list should not stifle or limit the learning or instructional process as students and advisors prepare themselves to solve integrated system problems in the workplace of today and tomorrow.~~

~~The Texas Agricultural Mechanics Committee composed of teacher representatives from each Area, teacher educators, and service providers, meet annually at the Professional Development Conference to identify the theme and specific skills foci for the upcoming year's events in Texas. The machinery focus is specified at this time. Minutes of previous Agricultural Mechanics Committee meetings and other information regarding the Agricultural Mechanics CDE can be found on the Texas Education Agency's Educational Excellence for AFNR web page for Agricultural Mechanics and Metal Technologies curriculum resources at <http://www.txeducationalexcellence.com/topic.aspx?ID=19&CID=1>~~

### ~~The schedule for Agricultural Technology and Mechanical Systems themes:~~

~~2017: Materials Handling Systems~~

~~2018: Processing systems~~  
~~2019: Plant Production Systems~~  
~~2020: Crop Production-Integrated Pest Management~~  
~~2021: Animal Production Systems~~

~~**UPDATE:** Due to the cancellation of 2020 Career Development Events, the above listed rotations have been suspended for 2021.~~

~~**2021 ATMS Theme: Crop Production-Integrated Pest Management.**~~

### **Insert**

F. The Texas Agricultural Mechanics Committee composed of teacher representative from each area, teacher educators, and service providers, will meet annually at the Texas Association of Ag Teachers Professional Development Conference to identify the theme and specific skills for upcoming year's event. All Ag Mechanics Committee meetings minutes will be made available on the Texas FFA ATMS CDE website. The minutes will include the theme and skill areas for the ATMS Event each year.

## **III. SCORING**

Written examination	100
Individual activities (3 at 30 pts each)	90
Team activity (each member receives 1/3 of team score – 42 pts max)	125
<b>TOTAL INDIVIDUAL POINTS</b>	<b>232</b>
<b>TOTAL TEAM POINTS</b>	<b>695</b>

## **IV. TIEBREAKERS**

Ties for teams will be broken as follows:

1. Team with the highest score in the team problem solving phase.
2. If still tied, the team with the highest score in the individual problem-solving phase of the event will win.
3. If still tied, the team with the highest alternate score will win.
1. If still tied, the advisors will match for the highest award.

Ties for individuals will be broken as follows:

2. Individuals with highest score in the individual problem-solving phase of the event will win.
3. If still tied, the team with the highest alternate score will win.
4. If the individuals are still tied, they will be accompanied by their advisor and will meet with contest officials who will conduct a coin toss to determine the higher placing individual.

## V. REFERENCES

- Related State-adopted Textbooks for Agricultural Science and Technology programs
- Suggested manufacturers' product information will be identified at the VATAT Professional Development Conference prior to the career development event.
- Materials Available from Instructional Materials Service (IMS): - Related Texas- Adopted Curriculum Materials –Related Reference Books and Videos –annual edition of the Mechanized Agriculture Systems CDE Handbook

More specific information will be available on the Texas Education Agency's Educational Excellence for AFNR web page for Agricultural Mechanics and Metal Technologies curriculum resources at:

<http://www.txeducationalexcellence.com/topic.aspx?ID=19&CID=1>