GENERAL INFORMATION PAGE
for
Agricultural Mechanics Career Development Events

Sponsored by:
Department of Biosystems and Agricultural Engineering
Oklahoma State University
Division of Agricultural Sciences and Natural Resources

Please read this general information below before proceeding to the specific contest guidelines found on page 3 of this document.

Contest Coordinators

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Contest Details:
Date: Saturday, April 26, 2008
Time: 7:00 to 7:45 AM (Registration)
Location: East side of Agricultural Engineering Laboratory building (Cleveland & Hall of Fame)

Contest Purpose, Objectives, Rules and Guidelines
All schools may register 1 to 4 students per event. If only 1 or 2 students are entered in a CDE, they will count and compete for individual awards only. If 3 or 4 students are entered, they will count as a team and compete for both individual and team awards. Team awards will be based on the best 3 scores. A school may only register one team per CDE or one or two individuals, not both a team and individual(s).

The schools will be informed of the location for each event at registration. It is the students' responsibility to insure that they are at the proper location at the appropriate time.

Content:
The BIOEN Interscholastics will consist of 3 CDE's and the National Qualifying event. The three CDE's are Farm Shop, Electricity, and Soil and Water Conservation. Each CDE will contain three parts—Written Test with Problem Solving, and two skill activities.

Organization:
Registration will commence at 7:00 and conclude at 7:45 the day of the event at the east side of the Agricultural Engineering Laboratory building. At 8:00 the skill section of the events will start. The written test/problem solving and skill activities will be completed within the one-hour time block. The students will enter each CDE on a first come first serve basis.

Those individuals and teams entered in the NQ CDE will be required to complete all parts of the other three CDE's.

Safety and Equipment
Each participant will BRING AND WEAR his/her own industrial quality eye protection (Z87-89) (with clear lenses) and any other appropriate personal protection devices including, but not limited to, long sleeves, gloves, and pliers. Check the individual CDE information pages for specific requirements.

Any participant not meeting these safety requirements will not be allowed to participate.

Any participant deemed to be a danger to themselves, others, or equipment will be escorted out of the CDE area and will receive a zero (0) score for that activity.

Disqualification
Teachers, parents and all other non-participating individuals will not be allowed in the room or the immediate area of any CDE activity. Failure to follow this guideline will result in disqualification of the team or individuals entered.

Teachers are invited and encouraged to review the activities after the event. A CDE official will remain at the site a few minutes after the last participant has finished.

Awards
The top five teams and top five individuals in each CDE will be presented a certificate. Participants in the NQC CDE are not eligible for consideration for individual or team awards in any of the other three (3) CDE areas. All four CDE's will count toward the Sweepstakes Trophy.

Additional Information
Previous years tests and skill sheets and available at the link on the contest page.

AGRICULTURAL SHOP
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Contest Superintendents

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Contest Details
Date: Saturday, April 26, 2008
Time: Registration: 7:00 a.m.
Location: Ag. Eng. Lab (Cleveland & Hall of Fame), OSU

Guidelines
All schools may register 1 to 4 students. If only 1 or 2 students are entered in the Ag Shop CDE they will count and compete for individual awards only. If 3 or 4 students are entered, they will count as a team and compete for both individual and team awards. The team awards will be based on the best three scores. A school may only register one team per CDE or up to two individuals.

The schools will be informed of the location for each event at registration. It is the students' responsibility to insure that they are at the proper location at the appropriate time.

Organization
Each participant will complete a written test with problem solving and two (2) skill activities. The test/problem solving will be limited to the skill activity for that event. One of the skill activities will pertain to the following schedule:

2008 **Oxyfuel or plasma arc cutting**
2009 Shielded Metal Arc Welding
2010 Gas Metal Arc Welding

The second skill activity may consist of, but not be limited to, an identification test that could include shop tools, welding equipment, welding equipment part identification or a second Ag mechanics skill such as tool reconditioning, solvent welding PVC, etc.

Safety and Equipment
Specific personal protection equipment, such as welding helmets and/or face shields, will be provided. Participants must provide their own industrial quality eye protection, with clear lenses, and any additional personal protection equipment that is appropriate for the activity.

Any student deemed to be a hazard to themselves, to others, or to shop equipment will be escorted from the area and will receive a zero (0) score for that activity.

Content
Examination questions will be developed primarily from the contents of UNDERSTANDIING, as listed below. The PERFORMANCE competencies will define the skill activities.

1. Welding fundamentals
    - 1.1 Understanding
        - 1.1.1 Four welding positions.
        - 1.1.2 Five types of joints.
        - 1.1.3 Five types of welds.
        - 1.1.4 Five factors that determine the quality of welds.
        - 1.1.5 Evaluate quality of beads and welds.
        - 1.1.6 Welding safety.
    - 1.2 Performance
        - 1.2.1 Prepare a 60^{o} bevel joint.
        - 1.2.2 Complete all five welds in the flat, horizontal and vertical positions.
        - 1.2.3 Combination of skills, such as locating and welding square tubing to a plate in a specific position.
2. Shielded Metal Arc Welding (SMAW)
    - 2.1 Understanding
        - 2.1.1 Describe the shielded arc welding process.
        - 2.1.2 Proper machine adjustment.
        - 2.1.3 Electrode selection.
        - 2.1.4 SMAW safety.
        - 2.1.5 Identification of and adjustments of power supplies.
        - 2.1.6 Use of welding tools and equipment.
        - 2.1.7 Five factors which control the quality of SMAW welds.
    - 2.2 Performance
        - 2.2.1 A pad in the flat, horizontal or vertical positions.
        - 2.2.2 Multiple pass joints.
        - 2.2.3 Complete all five joints in the flat position.
        - 2.2.4 Adjust machine controls for the desired weld.
3. Gas metal Arc Welding (GMAW)
    - 3.1 Understanding
        - 3.1.1 The GMAW process.
        - 3.1.2 Three primary types of metal transfer.
        - 3.1.3 Components of a GMAW system.
        - 3.1.4 Types of welding wire.
        - 3.1.5 Shielding gases.
        - 3.1.6 GMAW power supplies.
        - 3.1.7 Wire stickout.
        - 3.1.8 Factors which control the quality of GMAW welds.
        - 3.1.9 GMAW safety.
        - 3.1.10 Flux core welding wires

3.1.11 Pulse power supplies

3.2 Performance

3.2.1 Set up and shut down GMAW system.

3.2.2 Set machine controls for a weld.

3.3.3 Complete the five joints in flat, vertical and horizontal position.

3.3.4 Set machine for short circuiting or spray metal transfer.

4. Oxyfuel Welding

4.1 Understanding

4.1.1 Describe the oxyfuel process.

4.1.2 Identify parts of an oxyfuel system.

4.1.3 Factors which control the quality of welds.

4.1.4 Methods of controlling welding heat.

4.1.5 Three parts to a oxyfuel flame.

4.1.6 Three types of oxyfuel flames.

4.1.7 Differences between brazing and fusion welding.

4.1.8 Selecting filler rod.

4.1.9 Requirements for brazing and braze welding.

4.1.10 Fluxes for brazing and braze welding.

4.1.11 Oxyfuel safety.

4.2 Performance

4.2.1 Turning on the system and lighting the torch.

4.2.2 Steel fusion beads in the flat position.

4.2.3 Steel fusion joints in the flat position.

4.2.4 Brazing beads in flat and vertical position.

4.2.5 Brazing joints in the flat and vertical position.

4.2.6 Shuting down the oxyfuel system.

5. Oxyfuel and Plasma Arc cutting

5.1 Understanding

5.1.1 Describe the oxyfuel cutting process.

5.1.2 Describe the plasma arc cutting process.

5.1.3 Identify the parts of an oxyfuel cutting system.

5.1.4 Identy the parts of a plasma arc cutting system.

5.1.5 Factors which control the quality of oxyfuel cuts.

5.1.6 Factors, which control the quality of plasma, arc cuts.

5.1.7 Advantages and disadvantages of oxyfuel and plasma arc cutting.

5.1.8 Backfires and flashbacks.

5.1.9 Oxyfuel and plasma arc cutting safety.

5.1.10 Common methods for piercing holes.

5.2 Performance

5.2.1 Set up oxyfuel cutting system.

5.2.2 Make 90o and angle cuts using oxyfuel and plasma arc.

5.2.3 Pierce a hole to desired dimensions with oxyfuel cutting.

5.2.4 Lay out and cut to specifications.

5.2.5 Shut down oxyfuel cutting system.

5.2.6 Set controls for a plasma arc cutting system.

References

Oklahoma Core Curriculum

Welding Skills, 3rd Ed., B.J. Moniz & R.T. Miller, American Technical Publishers. ISBN: 0826930107

Agricultural Mechanics Fundamentals & Applications. Ray Herren, 2005, SBN/ISSN: 1-4018-5956-9, Thomson Delmar Learning

Gas Metal Arc Welding, Miller Electric Training Department, Miller Electric Manufacturing Company, 1991

Welding, John Deere Publishing, 2000, FOS5208NC, ISBN 086691269X, Deere & Company, Moline IL

Welding Handbook, 9th Ed., Vol. 1, 2 &3, American Welding Society, ISBN 0871716577