

OHIO CAREER DEVELOPMENT EVENT
AGRICULTURAL ENGINEERING TECHNOLOGY

Purpose

To assess students' knowledge in agricultural engineering technology.

Date

1. The district/state CDE date will be set annually by the Agricultural Education Service.

Location

District/State: Will be set annually by the Agricultural Education Service.

Connect to the National Web Page for current year information. www.ffa.org- or connect to National Ag Mechanics page for 2004-2005 (it is called Ag. Mechanics at the National level)

CDE Rules

District CDE

1. Each school may enter an unlimited number of dues paid FFA members as participants, the top 4 scores will be considered the "team" and the top 3 scores will be the team score of record.

2. The written test is an elimination for state competition.

State CDE

1. The top **TEN** teams (made up of the top 4 scores from each school) overall will compete in the State CDE that afternoon at OSU Ag. Engineering Building.

2. Each school may enter an unlimited number of dues paid FFA members as participants, the top 4 scores will be considered the "team" and the top 3 scores will be the team score of record.

CDE Format

2006-2007 Materials Handling Systems
2007-2008 Processing Systems
2008-2009 Plant Productin Systems
2009-2010 Integrated Pest Management

District CDE

1. A written test designed to evaluate the students'

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understanding of applied agricultural engineering will constitute the district CDE. The Department of Agricultural Engineering faculty at the Ohio State University will prepare the written test. The test will include the same subject matter areas as in the respective year's national CDE.

2. The test may consist of no more than 100 objective questions.

State CDE

1. The state CDE will be developed from the following five instructional areas:

a. Machinery and Equipment Systems- processing, materials handling, adjustments, metal fabrication, maintance and repair.

b. Industry and Marketing Systems- customer relations, accounting, communication, economics, safety, servicecalls, reading and understanding labels, planning, regulations.

c. Energy Systems- mechanical power, electrical power, chemical power, wind power, solar power, water power.

d. Structural Systems- concrete, plumbing, structural material, selection, heating, ventilation, air conditioning, metal and wood construction.

e. Environmental/Natural Resource Systems- water quality, material compatibility, soil and water conservation, handling of waster, recycling.

.2. Skill Activities - Each contestant will complete one or more specific hands-on performance operations in a set time period.

a. Problem Solving. Each contestant will complete one or more problem solving activities in each of the five instructional areas. A problem solving activity is a mental activity involving the gathering of information and the use of a logical process based on commonly accepted standards and information to arrive at a solution. Scientific principles and concepts will be used for solving problems. The exact problem may or may not be in a listed reference.

b. Written Test. A written test covering all subject matter areas as identified in the understanding and/or performance description pages. Each contestant will complete 30 multiple choice questions, in each of the three contest areas. Each contestant will have 40 minutes to complete these 90 questions.

3. The CDE will be conducted in four sessions for a total of 160 minutes involving the following:
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- a. Industry and Marketing Systems
- b. Machinery and Equipment Systems
- c. Energy Systems
- d. Structural Systems
- e. Environmental/Natural Resource Systems

4. The activity scores will be used in the following order to break a tie between teams or individuals:

- a. The written test score(s)
- b. The problem solving scores
- c. The skills score

5. The current year subject areas will be the same as that years National CDE subjects.

6. Safety equipment - Each contestant will be responsible for all personal safety equipment including:

a. Industrial Quality Eye Protection. No contestant will be allowed to participate in the performance of the CDE without "eye protection devices" (spectacles or goggles) that meet the standards of the American National Standard Practice for Occupational and Educational Eye and Face , Z87.1-1979 (or Z87.1-1968) and any subsequent revisions thereof, approved by the American National Standards Institute, Inc. Dress eyewear does not qualify as industrial quality eye protection. The descriptions of style A, B, and C industrial quality eye protection are as follows: STYLE A. Safety spectacles without side shields. They are for limited hazard use requiring only frontal protection. The addition of accessory side shields which are not firmly secured does not upgrade style A to style B or C. This style is not acceptable for use in the contest. 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. Safety spectacles with semi-or flat-fold shield which must be firmly secured to the frame. Style C glasses do not provide maximum protection from the top and bottom angles and are not recommended. Those wearing prescription eyewear which are not industrial quality must wear goggles while performing in the CDE skill areas.

c. Clothing. Each contestant shall furnish and wear coveralls, a shop coat or uniform for this event. Clothing must be in good repair and fit properly. Long sleeve clothing must be worn when welding or cutting.

d. Specialized Safety Equipment. Welding equipment such as helmets, goggles, face shields, and gloves will be furnished.

7. Tools and Equipment - All tools and equipment will be furnished for the contest. Contestants must use the tools and equipment furnished at the CDE site for all CDE areas.

8. Written Materials - All written materials will be furnished for the CDE. Contestants must provide clipboards and sharpened number 2 pencils. The use of an electronic calculator is encouraged. Personal computers may be provided for problem solving activities.

Competencies

The competencies with specific understandings and performances was identified from the subject matter. Examination questions will be developed primarily from the understanding category. The "performance" category will be the basis for skill activities. Problem solving activities may be developed from either understanding or performance categories.

Scoring System

District/State CDE

Individual

Written test 100 points

Problem solving-20 points per area 60 points

Performance skills-50 points per area 150 points

Total possible 310 points

Team

3 individuals x 310 points = 930 points (this score is figured adding the top three scores on the team)

Suggested References

The following list of references are indicative of books and manuals needed for the contest. It is the intent that test questions will be "generic" in nature and found in several specified sources or general textbooks.

Agricultural Power and Machinery
General Texts

1. FMO Safety - John Deere

2. Agricultural Power and Machinery - McGraw-Hill

3. Mechanics in Agriculture - Interstate

Tractor Power

1. Safe Tractor Operation and Daily Care -AAVIM
 2. Specifications for Tune-up and Service for Farm Tractors - AAVIM
 3. Selecting and Storing Fuels and Lubricants -AAVIM
 4. Operating Tractors for Grounds Keeping -AAVIM
 5. FOS - John Deere
Engines, Air Conditioning, Compact Equipment Series, Electrical, Hydraulics,
Power Trains
 6. FMO - John Deere
Preventative Maintenance, Tractors, Safety
 7. Diesel Fundamentals - Goodheart-Wilcox
 8. Understanding and Measuring Power - AAVIM
Small Engine Power.
 1. Care and Operation of Small Gasoline Engines- AAVIM
 2. Service and Repair Instructions- Briggs and Stratton Corp.
 3. Small Gasoline Engines - Hobar
 4. Air Cooled Engines Mechanics Training Manual, Form TM-6/2-ESA
 5. Small Gas Engines - Goodheart-Wilcox
 6. Step-By-Step Small Engine Repair Series- UMC-IML
 7. Chain Saw Maintenance and Repair Step-By-Step- UMC-IML
 8. Small Engines, Operation, Maintenance and Repair- AAVIM
- Agricultural Machinery and Equipment
1. Applying Pesticides - AAVIM
 2. Safe Operations of Agricultural Equipment -Hobar
 3. Plows and Plowing - The Ohio State University
 4. Combines and Combining - The Ohio State University
 5. Combines, Principles of Operation - The Ohio State

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6. Efficient Machine Harvesting - The Ohio State University
 7. Baler Operation, Service and Maintenance - The Ohio State University
 8. FMO-John Deere
Combines, Machinery Management, Tillage, Hay and Forage Harvesting, Planting,
Crop Chemicals
 9. FOS -John Deere
Belts and Chains, Mowing and Spraying Equipment, Bearings and Seals, Tires and Tracks
 10. Farm Machinery Fundamentals- America Publishing Co.
Agricultural Structures and Electrification
General Texts
 1. Agricultural Buildings and Structures- Reston Publications
 2. Practical Farm Buildings - Interstate
 3. National Electric Code 1987 Edition - Hobar
 4. Agricultural Mechanics - Delmar
 5. Agricultural Structures, Volume I and II- UMC-IML
Building Construction
 1. Fundamentals of Carpentry, Tools, Materials and Practices: Vol. I and II - American Technical Publishers
 2. Rafter Layout with Framing Square - Hobar
 3. Applying Roofing and Siding Products; No. 3035 - Vo Ag Services
 4. Using the Carpenter's Square; No.3009a - Vo Ag Services
 5. Using Stanley Framing Square, English and Metric - Stanley Tool
 6. Using Stanley Quick Square - Stanley Tool
 7. Hand Woodworking Tools - Delmar
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8. Portable Power Tools - Delmar

9. Power Tool Maintenance - McGraw-Hill

10. Working in Agricultural Mechanics - McGraw-Hill

Concrete Construction

1. Concrete and Concrete Masonry - Hobar

2. Proportioning and Placing Concrete - UMC-IML

3. Placing, Finishing and Curing Concrete- UMC-IML

4. Concrete Form Construction - Delmar

Electrical Circuits

1. Agricultural Wiring Handbook, 8th Edition (1987) - NFEC

2. Electrical Wiring Systems for Livestock and Poultry Facilities - NFEC

3. Farm Energy Analysis - NFEC

4. Check Stray Voltages on Farms - NFEC

5. Electrical Construction Wiring - American Technical Publishers

6. Fundamentals of Electricity- American Technical Publishers

7. Understanding and Using Electric Circuits- Interstate

8. Understanding Electricity and Electrical Terms- AAVIM

9. Electric Energy - AAVIM

10. Fundamentals of Electricity for Agriculture- AVI Publishing Company.

11. Agricultural Electrification - South-Western Publishing Co.

12. Electrical Wiring: Residential, Utility Buildings, Service Areas - AAVIM

13. Basic Electricity and Practical Wiring -Hobar

14. Farm Building Wiring Handbook - Hobar

15. Structures and Environment Handbook -MWPS

16. Electricity 1 and 2 - Delmar

Electric Motors

1. Electric Motors: Selection, Protection, Drives - AAVIM

2. How Electric Motors Start and Run - AAVIM

3. Electric Motors: Principles, Controls, Service and Maintenance - Hobar

4. Electrical Power: Motors, Controls, Generators- Goodheart-Wilcox

5. Electricity 3 and 4 - Delmar

Electric Controls, Switches and Sensing Devices

1. Electrical Controls and Basic Controls Used in Agricultural Production - Hobar

2. Electric Motors, Principles, Controls, Service and Maintenance - Hobar

3. Electrical Farm Equipment Guide - NFEC

4. Farm Energy Analysis - NFEC

Agricultural Construction and Soil and Water Conservation

General Texts

1. Agricultural Mechanics: Fundamentals and Applications - Delmar

2. Modern Agriculture Mechanics - Interstate

3. Developing Shop Safety Skills - AAVIM

4. Power Tool Safety and Operation - Hobar

5. Safety in the Shop; No.3022a - Vo Ag Services

6. Working in Agricultural Mechanics - McGraw-Hill

7. Agricultural Mechanics I Lesson Plans - UMC-IML

8. Agricultural Mechanics II Lesson Plans - UMC-IML

Arc Welding

1. Welding - FOS - John Deere

2. Welding Skills and Practices - American Technical Publications

3. Metals and Welding - Hobar

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4. Shielded Metal Arc Welding; No.3004a - Vo Ag Services
5. Modern Welding - Goodheart-Wilcox
6. Welding Technology - American Technical Publications
7. Basic Arc Welding - Delmar
8. Arc Welding - AAVIM
9. Arc Welding - Basic Fundamentals - Goodheart-Wilcox
10. GTAW Handbook - Goodheart-Wilcox.
11. Welding:Principles and Applications - Delmar
12. Arc Welding - UMC-IML

Fuel Gas Welding

1. Welding FOS - John Deere
2. Metals and Welding - Hobar
3. Oxyacetylene Welding and Cutting: No.3001a -Vo Ag Services
4. Basic Oxyacetylene Welding - Delmar
5. Oxyacetylene Welding: Basic Fundamentals-Goodheart-Wilcox
6. Welding: Principles and Applications - Delmar

7. Oxy-Acetylene Welding - UMC-IML

Tool Repair and Maintenance

1. Agricultural Mechanics: Fundamentals and Applications - Delmar
2. Modern Agricultural Mechanics - Interstate
3. Working in Agricultural Mechanics - McGraw-Hill

Hot Metal

1. Metals and Welding - Hobar
2. Ferrous Metals - Properties, Identification and Treatment: No. 3041 - Vo Ag Services
3. Modern Metal Working - Goodheart-Wilcox

Cold Metal

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1. Sharpening Hand Tools: No.3005 - Vo Ag Services
2. Soldering for Home, Farm and Shop Applications: No.3027 - Vo Ag Services

3. Metal work Technology and Practice - McKnight Publishing

4. Modern Metal Working - Goodheart-Wilcox

Plumbing

1. Planning Individual Water Systems - AAVIM
2. Modern Plumbing - Goodheart-Wilcox
3. Plumbing Installation and Design - American Technical Publications

4. Designing, Installing, Maintaining and Repairing Plumbing Systems; No. 3056 - Vo Ag Services

Fiberglass and Plastic

- 1 FOS Fiberglass/Plastic - John Deere Land Use, Management and Leveling

1. Agricultural Surveying: No.3010a - Vo Ag Services

2. Leveling and Land Measurement Practices for Agriculture - Hobar or Ag Ed, University of Arizona

3. Elementary Soil and Water Engineering - John Wiley and Sons

4. Soil and Water Conservation Engineering - John Wiley and Sons

5. Soil and Water Conservation, Semester Unit, - UMC - IML

6. Elementary Surveying - Harper and Row

7. Erosion and Sediment Pollution Control - Iowa State University Press

Conservation Practices

1. Conservation Farming - John Deere

2. Soil and Water Conservation - Iowa State University Press

3. Soil and Water Conservation, Semester Unit - UMC - IML

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4. Soil and Water Conservation Engineering - John Wiley and Sons

5. Elementary Surveying - Harper and Row

6. Erosion and Sediment Pollution Control - Iowa State University Press

Drainage and Irrigation

1. Planning for an Irrigation System - AAVIM

2. Elementary Soil and Water Engineering - John Wiley and Sons

3. Soil and Water Conservation - Iowa State University Press

4. Soil and Water Conservation, Semester Unit - UMC - IML

5. Soil and Water Conservation Engineering - John Wiley and Sons

6. Elementary Surveying - Harper and Row

7. Erosion and Sediment Pollution Control - Iowa State University Press

Addresses of Publishers.

1. AAVIM

120 Driftmeier Engineering Center
Athens, GA 30602

2. Ag Education Department
University of Arizona
Tucson, AZ 85721

3. American Technical Publishers, Inc.
12235 S. Laramie Ave.
Alsip, IL 60658

4. The AVI Publishing Co., Inc.
P.O.Box 831
Westfork, CT 06881

5. Briggs-Stratton Corporation
P.O. Box 831
Milwaukee, WI 53201

6. Delmar Publishers, Inc.
2 Computer Drive West, Box 15-015
Albany, NY 12212-9985

7. Engine Service Association (ESA)
700 N. Plankinton Ave. Suite 333
Milwaukee, WI 53203

8. Goodheart-Wilcox
123 West Taff Drive
South Holland, IL 60473

9. Harper and Row Publishers
10 East 53rd Street
New York, NY 10222

10. Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112

11. Interstate Printers and Publishers
P.O. Box 50
Danville, IL 61832-0050

12. Iowa State University Press
2121 S. State Avenue
Ames, IA 50010

13. John Deere Service Training
John Deere Road, Dept. 150
Moline, IL 61265-8098

14. John Wiley and Sons
P.O. Box 6793
Somerset, NJ 08873-9977

15. McGraw-Hill Book Company
1221 Avenue of the Americas
New York, NY 10020

16. National Food and Energy Council
409 Vandiver West- Suite 202
Columbia, MO 65202

17. Reston Publishing Company
A Prentice-Hall Company
Reston, VA 22090

18. South-Western Publishing Company
5101 Madison Road
Cincinnati, OH 45227

19. Stanley Tool Company
600 Myrtle Service
New Britain, CT 06050

20. The Ohio State University
Ohio Ag Ed Curr. Materials Service
2120 Fyffe Road
Columbus, OH 43210-1067

21. University of Missouri-Columbia - IML
10 Industrial Ed Bldg.
Columbia, MO 65211

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22. Vocational Agriculture Service
College of Agriculture, University of Illinois
1401 S. Maryland Drive
Urbana, IL 61801

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