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| **COURSE INTRODUCTION:**This course includes electrical wiring, electrical motors, concrete masonry, plumbing and sewage disposal, farm fences, product handling and processing equipment, and farm buildings. (CD 016720, CIP 01.0201) Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Basic construction skills and knowledge in electricity, plumbing, concrete, and masonry are necessary for the building of agricultural structures. |

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| **UNIT DESCRIPTION:** Students will learn to identify and describe Electricity terminology and practices used in the Agriculture industry. | **SUGGESTED UNIT TIMELINE: ???** **CLASS PERIOD (min.): 50 MINUTES** |
| **ESSENTIAL QUESTIONS:**1. How are electricity terms and practices used in the Agriculture industry? |
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| **ESSENTIAL MEASURABLE LEARNING OBJECTIVES**  | **CCSS LEARNING GOALS (Anchor Standards/Clusters)** | **CROSSWALK TO STANDARDS** |
| **GLEs/CLEs** | **PS** | **CCSS** | **OTHER** | **DOK** |
| 1. Identify the dangers and safety practices associated with electrical work.
 |  |  |  | A-CED-4L11-12.6RST11-12.9 | PST.01.01PST.02.01PST.02.02PST.03.04PST.04.01PST.04.02PST.04.03PST.04.04PST.05.01PST.05.02PST.05.03 | **1** |
| 1. Identify the terms associated with electrical work.
 |  |  |  | A-CED-4RST11-12.4RST11-12.9L11-12.6 | PST.01.01PST.02.01PST.02.02PST.03.04PST.04.01PST.04.02PST.04.03PST.04.04PST.05.01PST.05.02PST.05.03 | **1** |
| 1. Match types and sizes of wire and their uses.
 |  |  |  | A-CED-4L11-12.6RST11-12.3RST11-12.9 | PST.01.01PST.02.01PST.02.02PST.03.04PST.04.01PST.04.02PST.04.03PST.04.04PST.05.01PST.05.02PST.05.03 | **2** |
| 1. Identify the importance of grounding and GFCI protection.
 |  |  |  | A-CED-4RST11-12.9L11-12.6 | PST.01.01PST.02.01PST.02.02PST.03.04PST.04.01PST.04.02PST.04.03PST.04.04PST.05.01PST.05.02PST.05.03 | **2** |
| 1. Locate lights, outlets, and switches, and identify circuit protection needs.
 |  |  |  | A-CED-4RST11-12.3RST11-12.9L11-12.6 | PST.01.01PST.02.01PST.02.02PST.03.04PST.04.01PST.04.02PST.04.03PST.04.04PST.05.01PST.05.02PST.05.03 | **2** |
| 1. Identify the symbols used in agricultural wiring plans.
 |  |  |  | A-CED-4L11-12.6RST11-12.9 | PST.01.01PST.02.01PST.02.02PST.03.04PST.04.01PST.04.02PST.04.03PST.04.04PST.05.01PST.05.02PST.05.03 | **2** |
| 1. Describe practices for running wire to an agricultural structure and wiring within the building safely.
 |  |  |  | A-CED-4RST11-12.9L11-12.6SL11-12.4 | PST.01.01PST.02.01PST.02.02PST.03.04PST.04.01PST.04.02PST.04.03PST.04.04PST.05.01PST.05.02PST.05.03 | **2** |
| 1. Identify procedures for connecting the drop wires and branch circuit wires to the SEP.
 |  |  |  | A-CED-4RST11-12.9L11-12.6 | PST.01.01PST.02.01PST.02.02PST.03.04PST.04.01PST.04.02PST.04.03PST.04.04PST.05.01PST.05.02PST.05.03 | **2** |
| 1. Describe how to run wiring from the SEP to a junction box, lights, and receptacles.
 |  |  |  | A-CED-4RST11-12.9L11-12.6SL11-12.4 | PST.01.01PST.02.01PST.02.02PST.03.04PST.04.01PST.04.02PST.04.03PST.04.04PST.05.01PST.05.02PST.05.03 | **2** |
| 1. Calculate cost and electrical power using Ohm’s Law.
 |  |  |  | A-CED-4RST11-12.7 | PST.01.01PST.02.01PST.02.02PST.03.04PST.04.01PST.04.02PST.04.03PST.04.04PST.05.01PST.05.02PST.05.03 | **2** |
| 1. Describe procedures for planning and installing lighting protection.
 |  |  |  | A-CED-4RST11-12.9L11-12.6SL11-12.4 | PST.01.01PST.02.01PST.02.02PST.03.04PST.04.01PST.04.02PST.04.03PST.04.04PST.05.01PST.05.02PST.05.03 | **2** |
| 1. Identify problems in electrical systems.
 |  |  |  | A-CED-4RST11-12.9L11-12.6 | PST.01.01PST.02.01PST.02.02PST.03.04PST.04.01PST.04.02PST.04.03PST.04.04PST.05.01PST.05.02PST.05.03 | **2** |
| 1. Demonstrate an understanding of how to work with electricity and wiring by diagramming a wiring plan for an agricultural structure, identifying sources of electrical grounding in the structure, and completing a bill of materials for the project.
 |  |  |  | A-CED-4RST11-12.9L11-12.6SL11-12.4WHST11-12.2 | PST.01.01PST.02.01PST.02.02PST.03.04PST.04.01PST.04.02PST.04.03PST.04.04PST.05.01PST.05.02PST.05.03 | **3** |
| **ASSESSMENT DESCRIPTIONS\*: (Write a brief overview here. Identify Formative/Summative. Actual assessments will be accessed by a link to PDF file or Word doc. )** Students will diagram a wiring plan for a machinery shed using the appropriate symbols and identify sources of electrical grounding in the building. They will also complete a bill of materials for the project.Assessment will be based on the overall content and presentation of the work.**\*Attach Unit Summative Assessment, including Scoring Guides/Scoring Keys/Alignment Codes and DOK Levels for all items. Label each assessment according to the unit descriptions above ( i.e., Grade Level/Course Title/Course Code, Unit #.)** |
| **Obj. #** | **INSTRUCTIONAL STRATEGIES (research-based): (Teacher Methods)**  |
| 1-12 | 1. Lecture, Discussion, Study Questions, Group and Individual Project Work.
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| 1-13 | 1. Group and Individual Project Work, Presentations, and Evaluation of Projects by Peers and Teacher.
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|  | 1. Optional – Field Trip to Farm Sites.
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| **Obj. #** | **INSTRUCTIONAL ACTIVITIES: (What Students Do)** |
| 1-12 | 1. Students will engage in study questions in lessons 1 through 12.
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| 1-13 | 1. Students will complete “AS 1.1, Electricity on the Internet”; “AS 2.1, Electrical Terms”; “AS 3.1, Calculating Feeder Wire Size”; “AS 4.1, Grounding and GFCIs”; “AS 5.1, Evaluating Lights, Outlets, Switches, and Circuit Protection”; “AS 6.1, Diagramming Electrical Wiring”; “AS 7.1, Diagramming the Service Stack”; “AS 8.1, Identifying SEP Components”; “JS 9.1, Wiring a Three-Way Switch”; “AS 10.1, Calculating Electrical Costs”; “AS 11.1, Assessing Lightning Protection”; and “AS 12.1, Using Test Devices.”
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|  | 1. Additional activities that relate to the unit objective can be found under the heading “Other Activities” in the following locations: p. V-14, p. V-28, p. V-47, p. V-61, p. V-71, p. V-119, p. V-150, and p. V-180.
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| **UNIT RESOURCES: (include internet addresses for linking)*** *Agricultural Structures*. University of Missouri-Columbia, Instructional Materials Laboratory, 1999. (www.mcce.org)
* Cook, J. B., & Nickolaus, G. F. *Basic Procedures in Administration of Zoning Regulations: Appeals*. MU Extension. University of Missouri-Columbia. Accessed January 17, 2012, from <http://muextension.missouri.edu/explore/commdm/dm7613.htm>.
* Cook, J. B., & Nickolaus, G. F. *Basic Procedures in Administration of Zoning Regulations: Making Applications*. MU Extension. University of Missouri-Columbia. Accessed January 17, 2012, from <http://muextension.missouri.edu/explore/commdm/dm7612.htm>.
* Home Electrical Wiring. DoItYourself.com Inc. Accessed January 17, 2012, from <http://doityourself.com/electric/index.htm>.
* Local regulatory agencies, such as the planning and development department, public works department, and county board of commissioners
* NFPA Online. National Fire Protection Association. Accessed May 23, 2012, from <http://www.nfpa.org/index.asp>
* Students may use additional outside sources to complete this activity.
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