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| **COURSE INTRODUCTION:**  This course utilizes welding in the development and construction of major metal and wood projects. (CD 016770, CIP 01.0201).    Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Advanced skills in welding, woodworking, and project construction provide students with entry-level agricultural construction skills. |

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| **UNIT DESCRIPTION:**  Students learn the details involved in designing and creating a project from start to finish, including estimating materials and costs, creating drawings and plans, and assembling the project. | | | **SUGGESTED UNIT TIMELINE: 16-32 weeks**  **CLASS PERIOD (min.): 50 MINUTES** | | | | | |
| **ESSENTIAL QUESTIONS:**  **1. Why is it important to develop a bill of materials, projected cost list, and conceptual drawings prior to beginning a construction project?**  **2. What are the specific details you need to consider to complete a construction project?** | | | | | | | | |
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| **ESSENTIAL MEASURABLE LEARNING OBJECTIVES** | | **CCSS LEARNING GOALS (Anchor Standards/Clusters)** | | **CROSSWALK TO STANDARDS** | | | | |
| **GLEs/CLEs** | **PS** | **CCSS** | **AFNR Standards** | **DOK** |
| List the safety procedures for project construction. | |  | |  |  | L11-12.6  WHST11-12.2 | **CS.06.03**  **CS.07.01**  **CS.07.04**  **CS.08.02** | **1** |
| Select project and design a project plan. | |  | |  |  | WHST11-12.2 | **PST.04.01**  **PST.04.02** | **4** |
| Develop a bill of materials and a projected cost list. | |  | |  |  | N-Q-1  N-Q-2  N-Q-3 | **PST.04.01**  **PST.04.03**  **PST.04.04** | **4** |
| List tools needed to complete a project and list safety precautions. | |  | |  |  | L11-12.6  WHST11-12.2 | **CS.06.03**  **CS.07.01**  **CS.08.01**  **CS.08.02**  **CS.08.03**  **PST.01.03**  **PST.02.01**  **PST.02.02** | **1** |
| Determine the time frame for completion of a project | |  | |  |  |  | **PST.04.03** | **4** |
| Interpret a project construction plan. | |  | |  |  | RST11-12.2  RST11-12.4  RST11-12.9 | **PST.04.01**  **PST.04.02**  **PST.04.04** | **4** |
| Lay out and prepare materials for cutting. | |  | |  |  |  | **PST.01.03**  **PST.04.04** | **2** |
| Determine construction design for proper hitching and balancing. | |  | |  |  | G-CO-1  G-CO-6  G-CO-7  G-CO-12  G-GMD-4  G-GM-1  G-GM-3 | **PST.04.01**  **PST.04.02** | **4** |
| Determine construction design for legal specifications: width, length, weight, etc. | |  | |  |  | G-CO-1  G-CO-6  G-CO-7  G-CO-12  G-GMD-4  G-GM-1  G-GM-3 | **PST.04.01**  **PST.04.02** | **4** |
| Identify and correct project defects by approved methods. | |  | |  |  | G-CO-1  G-CO-6  G-CO-7  G-CO-12  G-GMD-4  G-GM-1  G-GM-3  RST11-12.3 | **PST.04.01**  **PST.04.02**  **PST.04.04** | **4** |
| Perform assembly procedures. | |  | |  |  | G-CO-1  G-CO-6  G-CO-7  G-CO-12  G-GMD-4  G-GM-1  G-GM-3  SL11-12.4 | **PST.01.03**  **PST.04.04** | **2** |
| Describe why a project should have a finish. | |  | |  |  | L11-12.6  SL11-12.4 | **PST.03.03**  **PST.04.04** | **2** |
| Determine actual cost of materials and labor for project. | |  | |  |  | N-Q-1  N-Q-2  N-Q-3 | **PST.04.01**  **PST.04.03** | **4** |
| Use hand and power tools in completing a project. | |  | |  |  |  | **PST.01.03**  **PST.02.01**  **PST.02.02**  **PST.04.04** | **2** |
| Demonstrate an understanding of the skills and procedures necessary to build a project by selecting an appropriate project; devising elevation drawings, a bill of materials, and a plan of procedure for the project; and applying their plan to complete the project within the allotted time. | |  | |  |  | N-Q-1  N-Q-2  N-Q-3  G-CO-1  G-CO-6  G-CO-7  G-CO-12  G-GMD-4  G-GM-1  G-GM-3  L11-12.6  RST11-12.9  WHST11-12.2 | **CS.01.01**  **CS.06.03**  **CS.07.01**  **CS.07.04**  **CS.08.01**  **CS.08.02**  **CS.08.03**  **PST.01.03**  **PST.02.01**  **PST.02.02**  **PST.04.01**  **PST.04.02**  **PST.04.03**  **PST.04.04** | **4** |
| **ASSESSMENT DESCRIPTIONS\*: (Write a brief overview here. Identify Formative/Summative. Actual assessments will be accessed by a link to PDF file or Word doc.4 )**  As part of the instructional strategies and activities for this unit, students will complete an estimated bill of materials, a list of tools and procedures and safety precautions, and a time estimation sheet for sample project plans included with the unit. For the performance-based assessment activity, students will apply the skills and procedures discussed in the unit to select, plan, and complete an appropriate project.  Assessment will be based on the overall quality of the work and the ability to safely and correctly complete the project within the available time.  **\*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. **Lecture** | | | | | | | |
|  | **2. Demonstration, Monitoring, Individualized Instruction** | | | | | | | |
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| **Obj. #** | **INSTRUCTIONAL ACTIVITIES: (What Students Do)** | | | | | | | |
|  | 1. Students will engage in study questions in lessons 1 through 14. | | | | | | | |
|  | 1. Students will complete “HO 2.1, Project Construction Check List”; “WS 3.1, Estimated Bill of Materials”; “WS 3.3, Where Are Materials Obtained?”; “WS 4.1, List of Tools and Procedures”; “WS 4.2, Tools—Safety Precautions”; ‘WS 5.1, Time Estimation Sheet”; “WS 6.1, Interpreting the Project Plan for a Pipe Sawhorse”; “WS 10.1, Quality Control — Project Evaluation Check List”; “WS 13.1, Actual Costs of Materials and Labor”; and “WS 14.1, Hand and Power Tools Used in Completing a Project.” | | | | | | | |
|  | 1. Additional activities that relate to the unit objective can be found under the heading “Other Activities” in the following locations:  p. VI-5 (1, 3, 4), p. VI-15 (2), pp. VI-25–VI-26 (2, 3), p. VI-41 (1, 2, 3, 4), p. VI-51 (1, 2), p. VI-57 (1, 2), p. VI-68 (2, 4),  p. VI-79 (1, 2, 3), p. VI-91 (2, 3, 4), p. VI-99 (1, 3, 4), p. VI-118 (2, 3), and p. VI-131 (1, 2). | | | | | | | |
| **UNIT RESOURCES: (include internet addresses for linking)**   * + *Agricultural Construction Volume I*. University of Missouri-Columbia, Instructional Materials Laboratory, 1989. www.mcce.org   + *Agricultural Mechanics Building Plans*. University of Missouri-Columbia, Instructional Materials Laboratory, 1994. www.mcce.org   + *Agricultural Mechanics Plans (Set)*. University of Missouri-Columbia, Instructional Materials Laboratory. [www.mcce.org](http://www.mcce.org)   + *Lincoln Electric* Lincoln Electric. Accessed January 15, 2012, from <http://www.lincolnelectric.com/>.   + Miller Electric. Accessed January 15, 2012, from <http://www.millerwelds.com/>.   + Master Plans Trailer Plans Store. Accessed January 15, 2012, from <http://www.trailerplans.com/> | | | | | | | | |