Course Title: Introduction to Masonry

Unit 1:	**Safety**

Content Standard(s) and Depth of Knowledge Level(s):	Students will: 1. Apply safety rules, regulations, and procedures for masonry construction. 2. Identify rules and regulations related to masonry construction.

Learning Objective(s) and Depth of Knowledge Level(s):	Students will: 1. Explain the meaning of safety. 2. Identify high hazard areas in the masonry construction industry. 3. Explain and demonstrate the use of appropriate personal protective equipment. 4. Demonstrate and explain masonry hand-tool and power-tool safety. 5. Recall masonry safety rules to be followed while in the shop. 6. Demonstrate knowledge of MSDS for all masonry materials. 7. Demonstrate knowledge of OSHA Masonry construction regulation (29 CFR 1926.706).

Essential Question(s):	What are the legal and social reasons for learning how to prevent accidents and how to respond to emergency situations related to the masonry industry?

Content Knowledge	**Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)**	**Suggested Materials, Equipment and Technology Resources**
I. Meaning/Importance of masonry safety. II. High hazard areas III. PPE IV. Masonry Hand and Power Tool Safety V. Safety Rules VI. Fall Restraint Systems used in Masonry	Lecture/demonstration Worksheets Masonry laboratory/shop safety tour Hazard identification tour Safe masonry tool operation demonstration Pretest/Post test Tour masonry construction site and evaluate safe practices	Guest speaker PowerPoints/ Projector Textbooks Quizzes Web sites Handouts Masonry Hand and power tools Videos MSDS PPE Safety Posters OSHA 29 CFR 1926.706

Unit Assessment:	Participation in class discussion, participation in masonry shop hazard identification, and masonry shop safety test (100%mastery)

Unit/Course CTSO Activity:	Incorporate safety practices into student's SAE project.

Unit/Course Culminating Product:	Students will master masonry lab safety by identifying mock safety hazards in the lab and by passing the safety portion of the lesson with a 100 on the lab safety test.

Course/Program Credential(s): ☒Credential ☐ Certificate ☒ Postsecondary Degree ☐University Degree
☐Other: Can lead to NCCER Credential

Course Title: Introduction to Masonry

Unit 2:	**Orientation**

Content Standard(s) and Depth of Knowledge Level(s):	Students will: 3. Describe skills needed to work as a mason. 4. Identify tools and equipment used in performing masonry work.

Learning Objective(s) and Depth of Knowledge Level(s):	Students will: 1. Explore the history of masonry construction. 2. Identify professions associated with the masonry construction industry. 3. Demonstrate knowledge of tools and equipment used in masonry construction. 4. Discuss various aspects of the masonry profession. 5. Discuss educational requirements for various levels of employment in the masonry profession.

Essential Question(s):	What does the student need to do to be successful in the masonry construction industry?

Content Knowledge	**Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)**	**Suggested Materials, Equipment and Technology Resources**
I. History of masonry II. Skills needed by a masonry worker III. Masonry construction career levels IV. Masonry tool and equipment identification	Lecture/demonstration Worksheets Masonry laboratory/ orientation tour Online research and Career Cruising Pretest/Posttest Tour masonry construction site and discuss aspects of the industry with masonry workers.	Guest speaker PowerPoint/ Projector Textbooks Quizzes Web sites and Career Cruising Handouts Masonry hand and power tools Videos

Unit Assessment:	Participation in class discussion, participation in Masonry Lab and Masonry Construction site tour, post test and performance.

Unit/Course CTSO Activity:	Incorporate masonry career information into student's SAE project and portfolio.

Unit/Course Culminating Product:	Students will gain knowledge of career information for masonry occupations.

Course/Program Credential(s): ☒Credential ☐ Certificate ☒ Postsecondary Degree ☐University Degree
☐Other: Can lead to NCCER Credential

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Unit 3:	**Blueprint and Layout**

Content Standard(s) and Depth of Knowledge Level(s):	Students will: 5. Interpret construction drawings and specifications for masonry construction. 6. Identify components and types of mortar used in masonry construction. • Demonstrating various mortar mixing procedures using specified equipment Examples: mixing mortar by hand, mixing mortar with a mechanical mixer 7. Describe types of masonry bonds. 8. Describe various techniques used in masonry wall construction. Examples: masonry bonds, setup, joints, construction

Learning Objective(s) and Depth of Knowledge Level(s):	Students will: 1. Identify various components of a set of blueprints. 2. Develop a take off of materials based on information found on the construction drawings. (Bill of Materials) 3. Categorize components and types of mortar used in masonry construction. 4. Mix mortar using mortar box and mortar hoe. 5. Mix mortar using mechanical mixer. 6. Dry lay each type of masonry bond. 7. Describe various techniques used in masonry wall construction.

Essential Question(s):	What is the purpose and importance of blueprints to the masonry industry?

Content Knowledge	**Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)**	**Suggested Materials, Equipment and Technology Resources**
I. Components of blueprint set II. Bill of material development III. Types of mortar and purpose IV. Methods of mortar mixing V. Masonry bonds and use VI. Setup and joints	Lecture/demonstration Worksheets and blueprints. Compare blueprints of a structure with the existing structure. Develop take offs (Bill of Materials) Pretest/Posttest Tour masonry construction site and compare the masonry work with the blueprints.	Guest speaker PowerPoint/ Projector Textbooks Quizzes Blueprints and construction drawings Handouts Videos Digital cameras

Unit Assessment:	Participation in class discussion, performance in developing take offs from blueprints and participation in construction site tour.

Unit/Course CTSO Activity:	Masonry construction site tour

Unit/Course Culminating Product:	Students will learn how to use blueprints in masonry construction.

Course/Program Credential(s): ☒Credential ☐ Certificate ☒ Postsecondary Degree ☐University Degree
☐Other: Can lead to NCCER Credential

Course Title: Introduction to Masonry

Unit 4:	**Jointing**

Content Standard(s) and Depth of Knowledge Level(s):	Students will: 9. Demonstrate basic block and brick construction techniques. 10. Use basic bricklaying procedures, including mixing of mortar. 11. Identify composition, reinforcement, and forms used for concrete construction.
Learning Objective(s) and Depth of Knowledge Level(s):	Students will: 1. Dry lay all masonry bonds 2. Lay selected bonds with different masonry units using mortar.(Instructional mortar may be formulated using 1 part tile setters cement and 3 parts sand mixed with clean water to the desired consistency. This mortar works like regular mortar and when it sets up it has no strength and can be crumbled and mixed with water and reused many times.) 3. Compare flat work, wall form, suspended, overhead, column, and pre-stress structural requirements for forming, reinforcement, air retention and placement of concrete based on engineering data.
Essential Question(s):	What is the purpose and importance of quality masonry construction techniques and close adherence to engineered design?

Content Knowledge	**Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)**	**Suggested Materials, Equipment and Technology Resources**
I. Masonry bonds II. Tool manipulation and mortar and masonry unit placement III. Forming of various structural components	Lecture/demonstration Worksheets and blueprints. Construct a masonry structure based on blueprints and engineer's specifications. Pretest/Post test	Guest speaker PowerPoints/ Projectors Textbooks Quizzes Blueprints and construction drawings Instructional mortar and masonry units Handouts Videos Digital cameras

Unit Assessment:	Participation in class discussion, performance in the construction of a selected structure according to blueprints and specifications.

Unit/Course CTSO Activity:	Masonry lab construction project

Unit/Course Culminating Product:	Students will learn basic block and brick construction techniques by building a small section of wall.

Course/Program Credential(s): ☒Credential ☐ Certificate ☒ Postsecondary Degree ☐University Degree
☐Other: Can lead to NCCER Credential

Course Title: Introduction to Masonry

Unit 5:	**Foundations**

Content Standard(s) and Depth of Knowledge Level(s):	Students will: 12. Identify various kinds of footings, including continuous, spread, stepped, and pier. 13. Demonstrate site layout and measurements for a slab-on-grade with existing foundation and a slab-on-grade with existing foundation and a slab-on-grade with integral foundation. 14. Demonstrate the finishing of concrete according to specifications for a masonry project.

Learning Objective(s) and Depth of Knowledge Level(s):	Students will: 1. Identify footings and match footings with structural and building site requirements. 2. Layout a foundation for a selected structure on a building site. 3. Place and finish flat work. 4. Stamp pattern finish flat work.

Essential Question(s):	What are the criteria used in selecting the type of footing to use for a structure?

Content Knowledge	**Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)**	**Suggested Materials, Equipment and Technology Resources**
I. Foundation types II. Foundation selection criteria III. Foundation layout IV. Footing design criteria V. Flatwork finishing techniques	Lecture/demonstration Worksheets and blueprints Tour local construction site and view layout procedure of foundation, construction of footing forms, and follow up tours until flat work is complete Hands on activity in each of the above processes Pretest/Post test	Guest speaker PowerPoints/ Projectors Textbooks Quizzes Blueprints and construction drawings Form materials Long tape Transit level w/ tripod. Handouts Videos Digital cameras

Unit Assessment:	Participation in class discussion, performance in the layout and construction of a selected foundation, footings and flatwork.

Unit/Course CTSO Activity:	Build or repair brick for nursing home in area or widow's home

Unit/Course Culminating Product:	Masonry lab construction project

Course/Program Credential(s): ☒Credential ☐ Certificate ☒ Postsecondary Degree ☐University Degree
☐Other: Can lead to NCCER Credential

Course Title: Introduction to Masonry

Unit 6:	**Estimation**

Content Standard(s) and Depth of Knowledge Level(s):	Students will: 15. Determine materials and supplies needed for a masonry project.

Learning Objective(s) and Depth of Knowledge Level(s):	Students will: 1. Calculate the materials needed to build a selected structure based on information provided on blueprints.

Essential Question(s):	What is amount and cost of material needed for the selected project?(cost based on research of current local prices)

Content Knowledge	**Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)**	**Suggested Materials, Equipment and Technology Resources**
I. Math calculations II. Blueprint interpretation III. Materials identification IV. Quantity of units in package	Lecture/demonstration Worksheets and blueprints. Pretest/Post test	Guest speaker PowerPoints/ Projectors Textbooks Quizzes Blueprints and construction drawings Handouts Videos Digital cameras

Unit Assessment:	Participation in class discussion, performance in the calculation exercise of a selected structure according to blueprints and specifications.

Unit/Course CTSO Activity:	Masonry lab construction project estimation of materials.

Unit/Course Culminating Product:	Considering safety and construction techniques, students will calculate the materials needed for a selected project, layout and construct the project with close adherence to engineer specifications.

Course/Program Credential(s): ☒Credential ☐ Certificate ☒ Postsecondary Degree ☐University Degree
☐Other: Can lead to NCCER Credential