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**PROGRAM CONCENTRATION:**

**Agriculture**

**CAREER PATHWAY:**

**\*Additional Course for**

**Agricultural Mechanics Pathway**

**COURSE TITLE:**

**Agricultural Construction**

**Course Description:** This course is designed to provide students with a more in-depth study of agricultural construction. Students interested in agricultural mechanics will have the opportunity to explore the many career possibilities in the field of agricultural construction. Additionally, hands-on-laboratory activities enhance the classroom learning experience and provide students with the skills needed to participate in Supervised Agricultural Experience Programs and FFA Career Development Events

**AG-AGC-1. Students will become oriented to the comprehensive program of agricultural education, learn to work safely in the agriculture lab and work sites, demonstrate selected competencies in leadership through the FFA and agricultural industry organizations, and develop plans for a supervised agricultural experience program (SAEP).**

- a. Explains the role of the Agriculture Education program and the FFA in personal development.
- b. Demonstrates knowledge learned through a Supervised Agricultural Experience Program (SAEP).
- c. Develops leadership and personal development skills through participation in the FFA.
- d. Explores career opportunities in Agriscience through the FFA and Agriculture Education Program.
- e. Explores the professional agricultural organizations associated with the course content.
- f. Explore the history and background of the FFA.

**Academic Standards:**

*ELA10C1 The student demonstrates understanding and control of the rules of the English language, realizing that usage involves the appropriate application of conventions and grammar in both written and spoken formats.*

*SCSh6 The student communicates scientific investigations and information clearly.*

*SCSh9 The student enhances reading in all curriculum areas.*

*ELA10LSV1 (d) The student actively solicits another person's comments or opinion. (e) The student offers own opinion forcefully without domineering.*

*ELA10LSV1 (i) The student employs group decision-making techniques such as brainstorming or a problem-solving sequence (e.g., recognizes problem, defines*

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*problem, identifies possible solutions, selects optimal solution, implements solution, evaluates solution).*

*ELA10LSV1 (e) The student offers own opinion forcefully without domineering. (f) The student contributes voluntarily and responds directly when solicited by teacher or discussion leader. (g) The student gives reasons in support of opinions expressed.*

**AG-AGC-2. Students will demonstrate woodworking skills.**

- a. Describe 10 careers in the woodworking industry.
- b. Explain requirements necessary to secure a job in the woodworking industry.
- c. Describe a safe work environment.
- d. Eliminate hazards in woodworking.
- e. Distinguish the areas identified by various safety colors and the importance of the coding.
- f. Describe the meaning of each safety color.
- g. Exhibit proper dress and protective devices for laboratory activities.
- h. Demonstrate the use of woodworking hand tools.
- i. Demonstrate the proper care and storage of hand tools.
- j. Demonstrate the techniques for restoring worn, damaged, or abused tools to good working condition.
- k. Describe common woods, including hardness and uses.
- l. Grade wood materials.
- m. Classify common dimension of wood materials for industry standards.
- n. Identify screws, nails, bolts, and other fasteners.
- o. Select screws, nails, bolts, and other fasteners for various uses.
- p. Identify three types of glues.
- q. Display proper techniques for making basic glue joints.
- r. Create woodworking project plans using simple drawing techniques.
- s. State the use and format of a bill of materials.
- t. Calculate the bill of materials.
- u. Select and plan projects that develop woodworking skills with hand tools.
- v. Handle and use woodworking tools without causing injury.
- w. Demonstrate proper techniques for using hand tools to the standards set by the instructor.
- x. Select and use wood filler for a woodworking project.
- y. Prepare wood projects for finishing by hand sanding with appropriate materials.
- z. Explain how to select and use paint, varnish, and stains on woodworking projects.

**Academic Standards:**

*SCSh2 The student uses standard safety practices for all classroom laboratory and field investigations.*

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*SCSh6 The student communicates scientific investigations and information clearly.*

*SCSh3 The student identifies and investigates problems scientifically.*

*SCSh4 The student uses tools and instruments for observing, measuring, and manipulating scientific equipment and materials.*

*MM1P3 The student communicates mathematically.*

*MM1P4 The student makes connections among mathematical ideas and to other disciplines.*

*MM1P5 The student represents mathematics in multiple ways.*

*ELA9RC2 The student participates in discussions related to curricular learning in all subject areas.*

*ELA9RC3 The student acquires new vocabulary in each content area and uses it correctly.*

*ELA9RC4 The student establishes a context for information acquired by reading across subject areas.*

**AG-AGC-3. Students will select, adjust, and use woodworking machines.**

- a. Describe basic stationary power woodworking machines.
- b. Perform basic procedures for using stationary power woodworking machines.
- c. Describe the major parts of specified machines.
- d. Analyze the main uses and safety precautions for each woodworking machine.
- e. Demonstrate the proper operation of basic power woodworking equipment.
- f. Assemble a project to plan specifications using power woodworking equipment.

**Academic Standards:**

*SCSh2 The student uses standard safety practices for all classroom laboratory and field investigations.*

*SCSh3 The student identifies and investigates problems scientifically.*

*MM1P3 The student communicates mathematically.*

*MM1P4 The student makes connections among mathematical ideas and to other disciplines.*

*MM1P5 The student represents mathematics in multiple ways.*

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*ELA9RC2 The student participates in discussions related to curricular learning in all subject areas.*

*ELA9RC3 The student acquires new vocabulary in each content area and uses it correctly.*

*ELA9RC4 The student establishes a context for information acquired by reading across subject areas.*

**AG-AGC-4. Students will construct an agricultural structure.**

- a. Interpret property maps to determine boundary lines.
- b. Analyze the impact of topography, climate, and utilities upon building construction.
- c. Analyze the environmental effects of the buildings being constructed.
- d. Interpret local codes and regulations for building construction.
- e. Interpret a blueprint and specifications of a building.
- f. Apply basic math skills to estimate construction materials.
- g. Identify construction materials for agricultural buildings.
- h. Prepare a materials list for estimating construction materials.
- i. Measure construction materials using measuring tools or instruments
- j. Design a cost efficient building.
- k. Design an energy efficient building.
- l. Design a building for the weather conditions of the local area.
- m. Set up and manipulate a builder's level and engineer's rod.
- n. Record accurate notes of elevation readings taken.

**Academic Standards:**

*SCSh2 The student uses standard safety practices for all classroom laboratory and field investigations.*

*SCSh3 The student identifies and investigates problems scientifically.*

*MM1P3 The student communicates mathematically.*

*MM1P4 The student makes connections among mathematical ideas and to other disciplines.*

*MM1P5 The student represents mathematics in multiple ways.*

*ELA9RC2 The student participates in discussions related to curricular learning in all subject areas.*

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*ELA9RC3 The student acquires new vocabulary in each content area and uses it correctly.*

*ELA9RC4 The student establishes a context for information acquired by reading across subject areas.*

**AG-AGC-4. Students will demonstrate the skills necessary for wiring basic circuits safely to industry standards.**

- a. Justify fundamental safety rules of electricity.
- b. Demonstrate safety procedures for electricity to teacher's standards.
- c. Explain the purpose of the National Electrical Code.
- d. Demonstrate the proper use of electrical tools.
- e. Select conductors of electricity.
- f. Identify single pole switches, duplex receptacles, and ceiling outlets.
- g. Select wire nuts and grounding materials to be used in basic circuits.
- h. Prepare and connect wires to receptacles, switches, and fixtures to standards of the electrical industry.
- i. Demonstrate the proper technique for grounding devices in a basic circuit.
- j. Describe the theory of electricity.
- k. Define electrical terms.
- l. Identify electrical symbols used in diagrams and floor plans.
- m. Select service entrance equipment for different jobs.
- n. Explain the theory of operation for branch circuits.
- o. Identify types of circuits and outlets.
- p. Plan electrical circuits.
- q. Select service entrance equipment for a specific job.
- r. Select materials to wire a branch circuit.
- s. Select appropriate grounding materials for a specific wiring system.
- t. Draw a wiring diagram using appropriate symbols according to the National Electrical Code.
- u. Install service entrance equipment.
- v. Install branch circuits.
- w. Install grounding materials.

**Academic Standards:**

*SCSh2 The student uses standard safety practices for all classroom laboratory and field investigations.*

*SCSh3 The student identifies and investigates problems scientifically.*

*SP3 The student evaluates the forms and transformations of energy.*

*SP5 The student evaluates relationships between electrical and magnetic forces.*

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*MM1P3 The student communicates mathematically.*

*MM1P4 The student makes connections among mathematical ideas and to other disciplines.*

*MM1P5 The student represents mathematics in multiple ways.*

*ELA9RC2 The student participates in discussions related to curricular learning in all subject areas.*

*ELA9RC3 The student acquires new vocabulary in each content area and uses it correctly.*

*ELA9RC4 The student establishes a context for information acquired by reading across subject areas.*

**AG-AGC-5. Students will demonstrate the plumbing skills for agricultural structures.**

- a. Perform the safety practices that should be observed in performing plumbing work in accordance to industry standards.
- b. Identify the proper tools to be used when plumbing with plastic materials.
- c. Maintain plumbing tools used in plumbing with plastic.
- d. Identify the standard plastic fittings used in plumbing.
- e. Select the correct plastic plumbing materials for plumbing installation.
- f. Select the correct plastic plumbing fittings for plumbing installation
- g. Demonstrate the proper uses of plumbing tools to standards set by the instructor.
- h. Prepare plastic plumbing materials for installation.
- i. Measure and cut plastic pipe to the standard set by the instructor.
- j. Select the proper fitting for the planned plumbing installation.
- k. Select the proper glues to use in different plumbing installations.
- l. Demonstrate the proper method to install plumbing.

**Academic Standards:**

*SCSh2 The student uses standard safety practices for all classroom laboratory and field investigations.*

*MM1P3 The student communicates mathematically.*

*MM1P4 The student makes connections among mathematical ideas and to other disciplines.*

*MM1P5 The student represents mathematics in multiple ways.*

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*ELA9RC2 The student participates in discussions related to curricular learning in all subject areas.*

*ELA9RC3 The student acquires new vocabulary in each content area and uses it correctly.*

*ELA9RC4 The student establishes a context for information acquired by reading across subject areas.*

**AG-AGC-6. Students will demonstrate concrete construction techniques to industry standards.**

- a. Practice construction safety practices.
- b. Identify safety equipment to use in concrete work.
- c. Identify hand tools used for concrete work.
- d. Demonstrate the proper skills of maintaining concrete hand tools.
- e. Differentiate the notations and symbols on plans and specifications for concrete.
- f. Apply the procedure for determining concrete in cubic yards.
- g. Identify the importance of estimating waste allowance.
- h. Apply precision skills with measuring tools.
- i. Explain the requirement for accuracy of measurement and estimates.
- j. Interpret the building plans and specifications regarding concrete mix ratio and quality.
- k. Lay out concrete forms.
- l. Install concrete forms using carpenter's tool kit.
- m. Lay out reinforcement using steel, wire mesh, and other materials with carpenter's tool kit.
- n. Install steel, wire mesh, and other materials with carpenter's tool kit.
- o. Apply safety procedures when using portable circular saw, hammers, sledges, and sharp edges.
- p. Measure cement, sand, gravel, and water.
- q. Prepare concrete mix for different types of weather conditions.
- r. Perform a slum test.
- s. Interpret plans for preparation of forms, delivery, placement, and consolidation of concrete into form.
- t. Describe procedures to screed wet concrete.
- u. Demonstrate the use of various types of hand finishing tools for concrete finishing.
- v. Describe the procedures to cure concrete.
- w. Select the proper ingredients for mixing concrete.
- x. Select the proper ingredients for mixing mortar.
- y. Demonstrate the proper procedures for mixing concrete.
- z. Demonstrate the proper procedure for mixing mortar.

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- aa. Locate tools needed for laying blocks.
- bb. Describe tools needed for mixing mortar.
- cc. Construct a corner for a block wall.
- dd. Demonstrate the proper procedures for using concrete tools in laying blocks.

**Academic Standards:**

*SCSh2 The student uses standard safety practices for all classroom laboratory and field investigations.*

*MM1P3 The student communicates mathematically.*

*MM1P4 The student makes connections among mathematical ideas and to other disciplines.*

*MM1P5 The student represents mathematics in multiple ways.*

*ELA9RC2 The student participates in discussions related to curricular learning in all subject areas.*

*ELA9RC3 The student acquires new vocabulary in each content area and uses it correctly.*

*ELA9RC4 The student establishes a context for information acquired by reading across subject areas.*

## **Reading Across the Curriculum**

### **Reading Standard Comment**

After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in *context*.

Beginning with the middle grades years, students begin to self-select reading materials based on personal interests established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.



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Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, researching, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

***CTAE-RC-1 Students will enhance reading in all curriculum areas by:***

**Reading in All Curriculum Areas**

- Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
- Read both informational and fictional texts in a variety of genres and modes of discourse.
- Read technical texts related to various subject areas.

**Discussing Books**

- Discuss messages and themes from books in all subject areas.
- Respond to a variety of texts in multiple modes of discourse.
- Relate messages and themes from one subject area to messages and themes in another area.
- Evaluate the merit of texts in every subject discipline.
- Examine author's purpose in writing.
- Recognize the features of disciplinary texts.

**Building Vocabulary Knowledge**

- Demonstrate an understanding of contextual vocabulary in various subjects.
- Use content vocabulary in writing and speaking.
- Explore understanding of new words found in subject area texts.

**Establishing Context**

- Explore life experiences related to subject area content.
- Discuss in both writing and speaking how certain words are subject area related.
- Determine strategies for finding content and contextual meaning for unknown words.

**CTAE Foundation Skills**

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that students pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Education

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Foundation (NCTEF) and the National Association of State Directors of Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and postsecondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

**CTAE-FS-1 Technical Skills:** Learners achieve technical content skills necessary to pursue the full range of careers for all pathways in the program concentration.

**CTAE-FS-2 Academic Foundations:** Learners achieve state academic standards at or above grade level.

**CTAE-FS-3 Communications:** Learners use various communication skills in expressing and interpreting information.

**CTAE-FS-4 Problem Solving and Critical Thinking:** Learners define and solve problems, and use problem-solving and improvement methods and tools.

**CTAE-FS-5 Information Technology Applications:** Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

**CTAE-FS-6 Systems:** Learners understand a variety of organizational structures and functions.

**CTAE-FS-7 Safety, Health and Environment:** Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

**CTAE-FS-8 Leadership and Teamwork:** Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

**CTAE-FS-9 Ethics and Legal Responsibilities:** Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

**CTAE-FS-10 Career Development:** Learners plan and manage

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academic-career plans and employment relations.

**CTAE-FS-11 Entrepreneurship:** Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.