

**PROGRAM CONCENTRATION:**  
**CAREER PATHWAY:**  
**COURSE TITLE:**

**Agriculture**  
**Agricultural Mechanics**  
**Agricultural Mechanics I**

**Course Description:** This laboratory course is designed to provide students with introductory level experiences in selected major areas of agricultural mechanics technology which may include small engine maintenance and repair, metal fabrication, wood working, electrical wiring, and maintenance of agricultural machinery, equipment, and tractors. Learning activities include information, skill development, and problem solving.

**AG-AMI-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. Explain the role of the Agriculture Education program and the FFA in personal development.
- b. Demonstrate knowledge learned through a Supervised Agricultural Experience Program (SAEP).
- c. Develop leadership and personal development skills through participation in the FFA.
- d. Explore career opportunities in Agriscience through the FFA and Agriculture Education Program.
- e. Explore 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.*

*ELA9RL5 The student researches the life of a particular person as it is represented in a variety of texts.*

*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*

*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-AMI-2. Students will identify careers in the Agricultural Mechanics Industry in the areas of woodworking, welding, small engines, electrical wiring, and agriculture machinery and operation.**

- a. Describe occupations in agricultural mechanics.
- b. Describe employment skills in agricultural mechanics.
- c. Explain requirements necessary to secure a job in the agricultural mechanics industry.
- d. Describe the job entry employment opportunities available in agricultural mechanics.
- e. Identify the professional careers available in agricultural mechanics.

**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.*

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

*ELA10LSV1 (i) The student employs group decision-making techniques such as brainstorming or a problem-solving sequence (e.g., recognizes problem, defines problem, identifies possible solutions, selects optimal solution, implements solution, evaluates solution).*

**AG-AMI-3. 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. Identify tools commonly used in the electrical industry.
- e. Demonstrate the proper use of electrical tools.
- f. Select conductors of electricity.
- g. Identify switches, receptacles, and lighting outlets.
- h. Select solderless connector, and grounding materials to be used in basic circuits.
- i. Prepare and connect wires to receptacles, switches, and fixtures to standards of the electrical industry.
- j. Demonstrate the proper technique for grounding devices in a basic circuit.

- k. Describe and identify the basic principles of electrical theory.
- l. Define electrical terms.
- m. Identify electrical symbols used in diagrams and floor plans.

**Academic Standards:**

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

*ELA12LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.*

*ELA9RL5 The student understands and acquires new vocabulary and uses it correctly in reading and writing.*

*ELA10W3 The student uses research and technology to support writing.*

*MM1A3 The student solves simple equations.*

*MA1P1 The student solves problems (using appropriate technology).*

*MA1P3 The student communicates mathematically.*

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

*SCSh3 The student identifies and investigates problems scientifically.*

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

*SP1 The student analyzes the relationships between force, mass, gravity, and the motion of objects.*

*SPS5 The student compares and contrasts the phases of matter as they relate to atomic and molecular motion.*

*SPS7 The student relates transformations and flow of energy within a system.*

**AG-AMI-4. Students will demonstrate the proper woodworking safety.**

- a. Describe a safe work environment.
- b. Eliminate hazards in woodworking.
- c. Distinguish the areas identified by various safety colors and the importance of the coding.
- d. Describe the meaning of each safety color.
- e. Exhibit proper dress and protective devices for laboratory activities.

Implementation date  
Fall 2009

**Academic Standards:**

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

*ELA12LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.*

*ELA9RL5 The student understands and acquires new vocabulary and uses it correctly in reading and writing.*

*ELA10W3 The student uses research and technology to support writing.*

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

**AG-AMI-5. Students will identify and maintain woodworking hand tools used in the woodworking industry.**

- a. Demonstrate the use of woodworking hand tools.
- b. Demonstrate the proper care and storage of hand tools.
- c. Demonstrate the techniques for restoring worn, damaged, or abused tools to good working condition.

**Academic Standards:**

*ELA10LSV1 (i) The student employs group decision-making techniques such as brainstorming or a problem-solving sequence (e.g., recognizes problem, defines problem, identifies possible solutions, selects optimal solution, implements solution, evaluates solution).*

*ELA12LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.*

*ELA9RL5 The student understands and acquires new vocabulary and uses it correctly in reading and writing.*

*ELA10W3 The student uses research and technology to support writing.*

*MA1P3 The student communicates mathematically.*

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

**AG-AMI-6. Students will identify types and grades of lumber used in today's woodworking industry.**

- a. Describe common woods, including hardness and uses.
- b. Grade wood materials.
- c. Classify common dimension of wood materials for industry standards.

**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.*

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

*ELA12LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.*

*ELA9RL5 The student understands and acquires new vocabulary and uses it correctly in reading and writing.*

*MA1P1 The student solves problems (using appropriate technology).*

*MA1P3 The student communicates mathematically.*

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

*SCSh3 The student identifies and investigates problems scientifically.*

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

**AG-AMI-7. Students will identify fasteners and glues used in today's woodworking industry.**

- a. Identify screws, nails, bolts, and other fasteners.
- b. Select screws, nails, bolts, and other fasteners for various uses.
- c. Identify three types of glues.
- d. Display proper techniques for making basic glue joints.

**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.*

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

Implementation date  
Fall 2009

*ELA10LSV1 (i) The student employs group decision-making techniques such as brainstorming or a problem-solving sequence (e.g., recognizes problem, defines problem, identifies possible solutions, selects optimal solution, implements solution, evaluates solution).*

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

*ELA12LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.*

*ELA9RL5 The student understands and acquires new vocabulary and uses it correctly in reading and writing.*

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

*SCSh3 The student identifies and investigates problems scientifically.*

**AG-AMI-8. Students will identify and explain proper maintenance requirements on a typical small gasoline engine as recommended by the manufacturer.**

- a. Practice appropriate safety precautions when operating and servicing small engines to industry standards.
- b. Interpret proper maintenance procedures using a service manual.
- c. Describe major systems of a small engine.
- d. Identify small engine parts.

**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.*

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

*ELA10LSV1 (i) The student employs group decision-making techniques such as brainstorming or a problem-solving sequence (e.g., recognizes problem, defines problem, identifies possible solutions, selects optimal solution, implements solution, evaluates solution).*

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

*ELA12LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.*

Implementation date  
Fall 2009

*ELA9RL5 The student understands and acquires new vocabulary and uses it correctly in reading and writing.*

*ELA10W3 The student uses research and technology to support writing.*

*MM1A3 The student solves simple equations.*

*MA1P1 The student solves problems (using appropriate technology).*

*MA1P3 The student communicates mathematically.*

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

*SCSh3 The student identifies and investigates problems scientifically.*

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

*SP1 The student analyzes the relationships between force, mass, gravity, and the motion of objects.*

*SPS7 The student relates transformations and flow of energy within a system.*

**AG-AMI-9. Students will properly demonstrate the skills necessary to safely and efficiently operate a tractor and related equipment.**

- a. Describe occupations in agricultural power and machinery.
- b. Describe employment skills in agricultural power and machinery.
- c. Identify operating instructions and safety procedures for operating agricultural machinery.
- d. Describe the importance of servicing machinery and equipment to manufacturers' recommendations.
- e. Set up a maintenance calendar using the manufacturer's service recommendations.
- f. Demonstrate basic service recommendation on agricultural machinery and equipment.
- g. Interpret service manual for tractor and farm machinery equipment.
- h. Identify common types of machinery used in the agricultural industry.
- i. Describe the functions and purposes of common types of machinery used in the agricultural industry.
- j. Select and procure machinery for agricultural industries.

**Academic Standards:**

Implementation date  
Fall 2009

*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.*

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

*ELA10LSV1 (i) The student employs group decision-making techniques such as brainstorming or a problem-solving sequence (e.g., recognizes problem, defines problem, identifies possible solutions, selects optimal solution, implements solution, evaluates solution).*

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

*ELA12LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.*

*ELA9RL5 The student understands and acquires new vocabulary and uses it correctly in reading and writing.*

*ELA10W3 The student uses research and technology to support writing.*

*MA1P1 The student solves problems (using appropriate technology).*

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

*SCSh3 The student identifies and investigates problems scientifically.*

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

*SP1 The student analyzes the relationships between force, mass, gravity, and the motion of objects.*

**AG-AMI-10. Students will demonstrate metal fabrication safety.**

- a. Describe a safe work environment.
- b. Recognize hazards in metal working.
- c. List the areas identified by various safety colors and the importance of coding.
- d. Describe safety color coding in metal fabrication.
- e. Wear proper dress and protective devices for lab activities.

**Academic Standards:**

Implementation date  
Fall 2009

*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.*

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

*ELA10LSV1 (i) The student employs group decision-making techniques such as brainstorming or a problem-solving sequence (e.g., recognizes problem, defines problem, identifies possible solutions, selects optimal solution, implements solution, evaluates solution).*

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

*ELA12LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.*

*ELA9RL5 The student understands and acquires new vocabulary and uses it correctly in reading and writing.*

*ELA10W3 The student uses research and technology to support writing.*

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

*SCSh3 The student identifies and investigates problems scientifically.*

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

*SP1 The student analyzes the relationships between force, mass, gravity, and the motion of objects.*

*SPS5 The student compares and contrasts the phases of matter as they relate to atomic and molecular motion.*

**AG-AMI-11. Students will identify and properly use metal fabrication hand tools.**

- a. Identify metal working hand tools and their use.
- b. Demonstrate the proper care and storing of hand tools.
- c. Demonstrate the techniques for restoring worn, damaged, or abused tools to good working condition.

**Academic Standards:**

Implementation date  
Fall 2009

*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.*

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

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

*ELA12LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.*

*ELA9RL5 The student acquires new vocabulary and uses it correctly in reading and writing.*

*ELA10W3 The student uses research and technology to support writing.*

*MA1P1 The student solves problems (using appropriate technology).*

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

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

**AG-AMI-12. Students will identify metal based on its characteristics.**

- a. Identify the different types of metals.
- b. Compare sizes of metal for purchase.

**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.*

*ELA9RL5 The student researches the life of a particular person as it is represented in a variety of texts.*

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

*ELA10LSV1 (i) The student employs group decision-making techniques such as brainstorming or a problem-solving sequence (e.g., recognizes problem, defines problem, identifies possible solutions, selects optimal solution, implements solution, evaluates solution).*

Implementation date  
Fall 2009

*ELA10LSV1 (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.*

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

*ELA12LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.*

*ELA9RL5 The student acquires new vocabulary and uses it correctly in reading and writing.*

*ELA10W3 The student uses research and technology to support writing.*

*MA1P1 The student solves problems (using appropriate technology).*

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

*SCSh3 The student identifies and investigates problems scientifically.*

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

*SP1 The student analyzes the relationships between force, mass, gravity, and the motion of objects.*

*SPS5 The student compares and contrasts the phases of matter as they relate to atomic and molecular motion.*

## **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.

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.

Implementation date  
Fall 2009

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 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

Implementation date  
Fall 2009



academic-career plans and employment relations.

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