Georgia CTAE: Agriculture, Food & Natural Resources Career Cluster

Agricultural Mechanics Technology I (2013)

Demonstrate employability skills required by business and industry. AFNR-AMTI-1	1 **Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities.** 1.1 2 **Demonstrate creativity by asking challenging questions and applying innovative procedures and methods.** 1.2 3 **Exhibit critical thinking and problem solving skills to locate, analyze and apply information in career planning and employment situations.** 1.3 4 **Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity.** 1.4 5 **Apply the appropriate skill sets to be productive in a changing, technological, diverse workplace to be able to work independently and apply team work skills.** 1.5 6 **Present a professional image through appearance, behavior and language.** 1.6
Orient and apply 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). AFNR-AMTI-2	1 **Explain the role of the Agriculture Education program and the FFA in personal development.** 2.1 2 **Demonstrate knowledge learned through a SAEP.** 2.2 3 **Designs, implements, and documents SAE by recording steps, skills acquired, and financial information.** 2.3 4 **Develop leadership and personal development skills through participation in the FFA.** 2.4 5 **Explore the history and background of the FFA.** 2.5
Identify careers in the Agricultural Mechanics Industry in the areas of agricultural	1 **Explore career opportunities in Agricultural Mechanics through the FFA and Agriculture Education Program.** 3.1

construction, agricultural electrical systems, welding and metal fabrication, and agriculture power machinery. AFNR-AMTI-3	**2** Explore the professional organizations associated with agricultural mechanics skills and related occupations. 3.2
	3 Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity. 3.3
	4 Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities. 3.4
	5 Exhibit critical thinking and problem solving skills to locate, analyze, and apply information in career planning and employment situations related to agricultural mechanics. 3.5
	6 Apply the appropriate skill sets to be productive in a changing, technological, and diverse workplace to be able to work independently, interpret data, and apply team work skills. 3.6
Recognize potential hazards in agricultural mechanics, identify how to create a safe work environment, and demonstrate proper safety practices. AFNR-AMTI-4	**1** Identify and eliminate potential hazards in the agricultural mechanics laboratory and/or work setting. 4.1
	2 Discuss the importance of safety in agricultural occupations. 4.2
	3 Describe features of a safe work environment in various agricultural mechanical locations. 4.3
	4 Select safety equipment and procedures for various agriculture related activities. 4.4
	5 Demonstrate safety procedures and appropriate behavior while working in the agriculture classroom, labs, and/or work sites. 4.5
	6 Distinguish the areas identified by various safety colors and the importance of the coding. 4.6
	7 Describe the meaning of each safety color. 4.7
	8 Identify and describe personal protective equipment required for various activities conducted in the agricultural mechanics laboratory and industry. 4.8
	9 Recognize potential hazards related to working with electricity, electric arc welders, hand tools, portable and stationary power equipment, power machinery, fasteners and fuels, lubricants, solvents, paints and other chemicals used in agricultural mechanics. 4.9
	10 Safely operate all hand tools, power tools, and equipment in the agricultural mechanics laboratory. 4.10

Identify and explain the correct use of common woodworking hand tools and layout tools used in woodworking and agricultural construction. AFNR-AMTI-5	**1** Identify common woodworking hand tools, layout tools and measuring tools. 5.1
	2 Demonstrate the proper care and use of hand tools, layout tools and measuring tools. 5.2
	3 Select and demonstrate appropriate techniques for restoring worn, damaged, or abused tools to good working condition. 5.3
Examine, identify, and select common types of lumber, fasteners, and finish materials used in woodworking and agricultural construction. AFNR-AMTI-6	**1** Describe and identify common woods; including hardness and uses. 6.1
	2 Examine wood materials and assess the characteristics of assigned industry grades. 6.2
	3 Classify common dimensions of wood materials. 6.3
	4 Identify screws, nails, bolts, and other fasteners. 6.4
	5 Select appropriate screws, nails, bolts, and other fasteners for various uses. 6.5
	6 Compare different types of wood glues and their recommended uses. 6.6
	7 Display proper techniques for making basic glue joints. 6.7
	8 Identify proper woodworking and agricultural construction preserving/finishing materials. 6.8
Demonstrate appropriate knowledge of electrical terms and theory, and explain the operating principles of various types of electrical circuits. AFNR-AMTI-7	**1** Describes and identifies the basic principles of electrical theory. 7.1
	2 Describes types of electrical circuits. 7.2
	3 Defines electrical terms. 7.3
	4 Describes the relationship between watts, volts, amps and resistance. 7.4
	5 Explains the purpose of the National Electrical Code. 7.5
	6 Identify electrical symbols used in electrical schematics and floor plans. 7.6
	7 Create electrical schematics that use appropriate electrical symbols and follow National Electrical Code requirements. 7.7
Demonstrate skills in selecting tools, conductors, devices, electrical enclosures and related materials necessary for planning and installation of electrical circuits for	**1** Identify tools commonly used in the electrical industry. 8.1
	2 Demonstrate the proper use of electrical tools. 8.2
	3 Identify types of electrical cable used in agricultural applications. 8.3
	4 Calculate load for specific circuit applications and describe potential hazards of overloads on a circuit. 8.4

agricultural and residential applications. AFNR-AMTI-8	5 Select conductors for circuit applications based on given load, location, temperature and distance parameters 8.5
	6 Compare and contrast switches, receptacles, lighting outlet devices, grounding conductors, solderless connectors and related materials for use in agricultural and residential electric circuits. 8.6
	7 Demonstrate proper use of tools for preparing conductors, mounting electrical enclosures and connecting devices for branch and feeder circuits. 8.7
	8 Install branch circuit enclosures, conductors and devices and explain how each installation is completed in accordance with the National Electrical Code. 8.8
Define shielded metal arc welding, describe types of welded joints and weld positions, compare and contrast metals for use in the construction of agricultural structures and equipment, explain the appropriateness of electrodes for various metals and weld applications, demonstrate the ability to select the proper welding amperage for various metal thicknesses and joint types and demonstrate skills necessary to prepare metals and weld joints with the shielded arc welding process. AFNR-AMTI-9	1 Define terms associated with shielded metal arc welding. 9.1
	2 Describe the parts of an arc welder. 9.2
	3 Compare alternating current, direct current and transformer rectifier welders and list advantages and disadvantages for each. 9.3
	4 Compare the direct current electrode negative and direct current electrode positive weld processes and explain the application of each. 9.4
	5 Select electrodes based upon type of metal to be welded, material thickness, and weld position. 9.5
	6 Select amperage and adjust welders for optimum weld performance. 9.6
	7 Demonstrate proper welding techniques for various welded joints and weld positions. 9.7
	8 Identify metal fabrication equipment and demonstrate the ability to set-up, adjust and use metal fabrication equipment to cut, shear, punch, break and bend metal. 9.8
	9 Identify metals and alloys used in metal fabrication based on their metallurgical properties. 9.9
Demonstrate and describe the proper set-up and use of the oxy-fuel welding and cutting outfit for cutting steel and welding various material thicknesses and joint types. AFNR-AMTI-10	1 Describe the parts of an oxy-fuel welding and cutting outfit including parts of the regulator, torch body, hose fittings, welding tips and cutting attachments. 10.1
	2 Describe the role of oxygen in the welding and cutting process. 10.2
	3 Describe the role of fuels in the welding and cutting process. 10.3
	4 Compare and contrast different fuels used with oxygen in oxy/fuel welding and cutting. 10.4

	5 Demonstrate and explain the safe set-up and shut down procedures for using the oxy/acetylene welding and cutting outfit. 10.5
	6 Perform welding and cutting operations to industry standards. 10.6
Describe the operating principles of a four stroke engine, identify and describe the function of the major components of small, four stroke/cycle engines and identify and explain proper maintenance procedures for four stroke cycle engines in accordance with the manufacturer's recommendations. AFNR-AMTI-11	1 Identify and compile a list of common small engine components. 11.1
	2 Explain how a small engine operates and compare the similarities and differences between four stroke-cycle engines and two stroke-cycle engines. 11.2
	3 Interpret service and parts manuals for small engines and identify operating instructions and safety procedures for operating small engines. 11.3
	4 Identify tools commonly used for small engine service and repair. 11.4
	5 Describe the importance of regularly servicing small engines. 11.5
	6 Create and display a maintenance calendar utilizing small engine owner's manuals. 11.6
	7 Perform basic service procedures according to manufacturer's recommendations. 11.7
	8 Compare proper maintenance procedures using service manuals from a variety of small engine manufacturers. 11.8
Demonstrate and explain the skills necessary to safely and efficiently operate agricultural tractors and related equipment including mowers used in lawn maintenance. AFNR-AMTI-12	1 Identify operating instructions and safety procedures for proper operation of agricultural machinery. 12.1
	2 Identify common types of machinery used in the agricultural industry. 12.2
	3 Describe the functions and purposes of common types of machinery used in the agriculture industry. 12.3
	4 Compare and contrast the operating instructions and safety procedures for operating a tractor between various manufacturers. 12.4
	5 Operate the tractor and or lawn equipment safely as recommended by the manufacturer. 12.5