Principals of Agriculture Mechanics

Fall 2017

1st period

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Room VI

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http://www.tn.gov/education/cte/AgricultureFo
https://www.ffa.org/thecouncil/afnrodNaturalResources.shtml

Principle of Agricultural Mechanics is an intermediate course introducing students to basic skills and knowledge in construction and land management for both rural and urban environments. This course covers topics including project management, basic engine and motor mechanics, land surveying, irrigation and drainage, agricultural structures, and basic metalworking techniques. Upon completion of this course, proficient students will be prepared for more advanced coursework in agricultural mechanics. Standards in this course are aligned with Tennessee State Standards for English Language Arts & Literacy in Technical Subjects, Tennessee State Standards for Mathematics, and National Agriculture, Food, and Natural Resources Career Cluster Content Standards.*

-Course Fee: $12 or $20 with a FFA T-shirt: Due by Sept 8, 2016.

This course will give students a basic understanding of an Agriculture Mechanics Shop. We will cover safety, which will include a test that each student MUST make a 100% to pass. We will work in the shop areas on welding, torch cutting, rafter cutting, plumbing, electrical outlets and three way switches, reading a transit and Philadelphia Rod and basic planning for small projects.

Each student is required to wear long pants and closed toed shoes (boots) while working in the shop area. Safety classes are also required and are to be worn at all times while working in the shop area. None compliance with any safety rule will result in a suspension of shop time with
an oral report due the next class period. Work clothes and safety glasses will be the responsibility of the student!

WEEK ONE

SAFETY

1. Interpret OHSA rules and regulations as they apply to an Agriculture Shop.
2. Shop walk through with a safety ledger and recommendations for change.

WEEK TWO

SAFETY

1. Review common laboratory safety procedures for tool and equipment operation in the agricultural mechanics laboratories, including but not limited to accident prevention and control procedures. Demonstrate the ability to follow safety and operational procedures in a lab setting and complete a safety test with 100 percent accuracy.

WEEK THREE

PROJECT MANAGEMENT

1. Outline the basic principles and procedures of effective project planning. Create and present a project plan for an agricultural mechanics project or a supervised agricultural experience program related to agriculture mechanics.

2. Interpret plans and working drawings to select appropriate building materials for a given agricultural structure. Using correct units and measurements, draft a written bill of materials enumerating the quantities of each selection, including but not limited to concrete, masonry, wood, metal, and composite materials.

3. Applying construction principles pertaining to wood, concrete, metal, masonry, plumbing and electricity construct or repair an agricultural structure according to prescribed working plans.

WEEK FOUR

PROJECT MANAGEMENT
1. Interpret plans and working drawings to select appropriate building materials for a given agricultural structure. Using correct units and measurements, draft a written bill of materials enumerating the quantities of each selection, including but not limited to concrete, masonry, wood, metal, and composite materials.

2. Applying construction principles pertaining to wood, concrete, metal, masonry, plumbing and electricity construct or repair an agricultural structure according to prescribed working plans.

WEEK FIVE

PROJECT MANAGEMENT

1. Interpret plans and working drawings to select appropriate building materials for a given agricultural structure. Using correct units and measurements, draft a written bill of materials enumerating the quantities of each selection, including but not limited to concrete, masonry, wood, metal, and composite materials.

2. Applying construction principles pertaining to wood, concrete, metal, masonry, plumbing and electricity construct or repair an agricultural structure according to prescribed working plans.

WEEK SIX

AGRICULTURE STRUCTURES

1.) Using industry-specific terminology, identify components for preparing a budget and cost estimate. Develop a budget using a scaled drawing or blueprint to construct or repair an agriculture mechanics project.

2.) Interpret plans and working drawings to select appropriate building materials for a given agricultural structure. Using correct units and measurements, draft a written bill of materials enumerating the quantities of each selection, including but not limited to concrete, masonry, wood, metal, and composite materials.

3) Applying construction principles pertaining to wood, concrete, metal, masonry, plumbing and electricity construct or repair an agricultural structure according to prescribed working plans.
WEEK SEVEN

AGRICULTURE STRUCTURES

1.) Using industry-specific terminology, identify components for preparing a budget and cost estimate. Develop a budget using a scaled drawing or blueprint to construct or repair an agriculture mechanics project.

2.) Interpret plans and working drawings to select appropriate building materials for a given agricultural structure. Using correct units and measurements, draft a written bill of materials enumerating the quantities of each selection, including but not limited to concrete, masonry, wood, metal, and composite materials.

3) Applying construction principles pertaining to wood, concrete, metal, masonry, plumbing and electricity construct or repair an agricultural structure according to prescribed working plans.

WEEK EIGHT

SURVEYING

1) Using topographical maps and appropriate mathematical equations, determine the acreage of a specific plot of land. Document and defend the methods used to arrive at the result, annotating calculations and field notes in a manner easily retrieved by other readers.

2) Apply precision surveying processes and geographic information system (GIS) technology to calculate the acreage of a specific plot of property. Using field notes and digital data (such as GIS overlays), develop a written survey report of the designated plot to include, at minimum, measurements, degrees, markers, and other notable geographic parameters.

WEEK NINE, TEN AND ELEVEN

AGRICULTURE METAL WORKING

14) Compare and contrast the physical and chemical properties of arc welding, metal inert gas (MIG) welding, gas welding, soldering, and brazing. Demonstrate
the ability to precisely follow operational and safety procedures for each fusion process across various applications.

15) Classify the physical and chemical properties associated with various metal-cutting methods. Demonstrate adherence to operational and safety procedures for using oxy-fuel or plasma in applications involving mild steel, copper, sheet metal, and cast iron. 16) Select and demonstrate the best method to construct, connect, or repair metallic and nonmetallic materials for a variety of agricultural applications, including but not limited to plumbing, sheeting, and equipment.

WEEK 12 AND 13

IRRIGATION AND DRAINAGE

9) Analyze the interrelationships among plants, water, air, and soil to maximize the health and productivity of agricultural crops. Calculate the permeability rate, available water holding capacity, pH levels, and nutrient levels for a specific soil type.

10) Apply physics concepts governing various pumping systems and delivery options to achieve the optimum irrigation and drainage required for row crop, greenhouse, and nursery operations in various soil-plant-climate combinations. Develop irrigation schedules to satisfy the design daily irrigation requirements (DDIR) for specific crops, citing specific textual evidence.

11) Compare and contrast irrigation methods for row crops, attending to such factors as water conservation, efficiency, and cost. Investigate and document findings on the effectiveness and efficiency of a surface irrigation versus a drip irrigation method, developing claim(s) and counterclaim(s) for scenarios in which each method would be most applicable.

WEEK 14

Engine and Motor Mechanics

5) Compare and contrast the chief features, functions, and applications of two-cycle engines, four-cycle engines, and electric motors. Citing technical references, recommend a maintenance schedule specific to the working environment (such as indoor/outdoor conditions, exposure to heat or cold) of the engine and/or motor. Conduct the appropriate maintenance with adherence to specifications outlined in the schedule.
6) Identify and differentiate between the different types of fuel and power sources used in conjunction with engines and motors. Recommend the types and sizes of engines/motors best suited for a range of applications. Provide a written justification, citing specific textual evidence, to support the recommendation.

WEEK 15-18

These weeks will be AGRICULTURE PROJECT WEEKs.

PROJECTS COME UP ALL THE TIME IN THIS SHOP, SUCH AS WOOD WORKING, METAL WORKING, AND WIRING. THESE PROJECTS WILL BE INCLUDED INTO THE CURRICULUM AS NEEDED.

IF YOU HAVE ANY QUESTIONS CONCERNING OUR SHOP PLEASE FEEL FREE TO EMAIL, CALL, OR COME BY THE SHOP TO SEE WHAT WE ARE WORKING ON.

THIS CLASS IS STUDENT PACED AND ORIENTED.