Effective: Fall 2017
Last Reviewed: 11/04/2016

Course Outline

BASIC COURSE INFORMATION

Course Number: AGM 221

Course Title: INTRODUCTION TO AGRICULTURE MECHANICS

Total Student Hours and Credit			
		Hours/Week	Hours/Term
Lecture Hours	in-class	2.00	36.00
	out-of-class	4.00	72
Lab Hours	in-class	4.00	72.00
	out-of-class	0	0
Activity Hours	in-class		0
	out-of-class	0	0
TBA Hours Per Term			0
Total Student Hours Per Term:			180.00
Hours-per-unit Divisor			54.00
Units of Credit:			3.00

Fall semester term is 18 weeks. Spring semester term is 17 weeks. The term length multiplier is 17.5 weeks. Curriculum is calculated based on 18 weeks.

Catalog Description:
Introduces basics in safety, tools, rope work, plumbing, concrete, blueprint reading, electrical, woodworking, metalworking and agriculture mechanics careers. Designed for students who seek to develop basic mechanical skills.

Schedule Description:
Introduces basics in safety, tools, rope work, plumbing, concrete, blueprint reading, electrical, woodworking metalworking and agriculture mechanics careers. Designed for students who seek to develop basic mechanical skills. Transfer: CSU.

Division: Business Education

Department: Agriculture

Minimal Qualification Discipline Designation (MQDD): Agriculture OR Agricultural Engineering

Degree Applicability: Credit - Degree Applicable

Methods of Instruction:

- Lecture and/or discussion
- Laboratory/Studio/Activity
- Lecture/Lab

Grading Method:

- Letter Grade or P/NP

Repeatability: 0

Course Cap: 20

STUDENT LEARNING OUTCOMES

1. Distinguish between the different tools, materials and machines used in agriculture mechanics and demonstrate how to use them properly and safely.
2. Identify safety hazards and eliminate them before accidents occur.
3. Specify, select, and order material common to the agriculture mechanics industry and utilize that material in various construction situations and projects.
4. Apply integrated knowledge with incremental skill improvement resulting in functional application of agriculture mechanics techniques.

COURSE CONTENT

Objectives:
Upon completion of this course the student will be able to:

1. Identify safety hazards and eliminate them before accidents occur.
    - Class Performance(s)
    - Lab Reports
    - Performance Exams
    - Quizzes/Exams
    - Written/Typed Homework
2. Identify and demonstrate proper use, care and adjustment of common and precision tools and machines found in the farm shop.
    - Class Performance(s)
    - Lab Reports
    - Performance Exams
    - Quizzes/Exams
    - Written/Typed Homework
3. Identify and care for various kinds of rope.
    - Class Performance(s)

- Lab Reports
- Performance Exams
- Quizzes/Exams
- Written/Typed Homework

4. Demonstrate knowledge of rope knots by tying several useful knots.
    - Lab Reports
    - Performance Exams
    - Quizzes/Exams
5. Identify and select the proper pipe and pipefittings for the application.
    - Class Performance(s)
    - Lab Reports
    - Performance Exams
    - Written/Typed Homework
6. Perform knowledge of concrete by mixing, forming, pouring, screeting and finishing a slab to a proper size and slope.
    - Lab Reports
    - Performance Exams
    - Quizzes/Exams
    - Written/Typed Homework
7. Interpret a working set of blueprints by identifying the symbols used.
    - Class Performance(s)
    - Lab Reports
    - Performance Exams
    - Quizzes/Exams
    - Written/Typed Homework
8. Demonstrate basic principles of electricity and magnetism.
    - Group Work
    - Lab Reports
    - Performance Exams
    - Quizzes/Exams
    - Written/Typed Homework
9. Assess the different types of wood and classify how they are named
    - Quizzes/Exams
    - Written/Typed Homework
10. Differentiate between the four metal joining processes demonstrated and select the appropriate method.
    - Quizzes/Exams
    - Written/Typed Homework
11. Identify occupations in agriculture that require mechanical skills.
    - Internet Research
    - Quizzes/Exams
    - Written/Typed Homework

Topics & Scope:

1. Safety
    1. Safe Shop Practices
    2. Proper Protective Equipment
    3. Safety Colors
    4. Fire Extinguishers

    (Obj 1)
2. Hand Tools, Fasteners and Hardware
    1. Hand Tools
        1. Layout Tools
        2. Saws
        3. Boring Tools
        4. Hammers
        5. Pliers
        6. Wrenches
        7. Chisels and Punches
        8. Screwdrivers
        9. Clamps
        10. Wrecking Tools
        11. Digging Tools
    2. Fasteners
        1. Nails
        2. Screws
        3. Bolts
        4. Nuts
        5. Washers
        6. Machine Screws
    3. Hardware
        1. Hinges
        2. Brackets
        3. Flush Plates

    (Obj 2)
3. Rope work
    1. Rope types and common uses
    2. Rope care and repair
    3. Types of splices and knots

    (Obj 3, 4)
4. Plumbing
    1. Selection, operation and care of plumbing tools
    2. Fitting types and selection
    3. Plumbing repairs
    4. Project layout, measuring and construction

    (Obj 5)
5. Concrete
    1. Physical properties and strength
    2. Calculation of proper bill of materials

3. Estimating material and labor costs

(Obj 6)

6. Blueprints
    1. Sketching a three view drawing
    2. Blueprint reading and symbol identification

    (Obj 7)
7. Electrical
    1. Circuit connections and splices
    2. Lighting Circuit layout and construction
    3. Receptacle circuit layout and construction

    (Obj 8)
8. Woodworking
    1. Selection and grading of lumber
    2. Measuring, marking and project layout
    3. Power tool selection, care and proper use
    4. Material fastening and joint construction

    (Obj 9)
9. Metalworking
    1. Cold metal joining selection and procedures
    2. Hot metal joining selection and procedures
    3. Sheet metal identification
    4. Tool selection, care and proper use

    (Obj 10)
10. Careers
    1. Agricultural Divisions
    2. Career Selection
    3. Meeting the Challenge

    (Obj 11)

Assignments:
Examples of independent assignments to fulfill 72 total hours of required out-of-class work:

1. Plumbing Map- Student will utilize their knowledge of the different types of plumbing and their purposes to map out the plumbing in their home/apartment. Student will complete a pictorial diagram with a legend detailing the image. (Obj 5)
2. Careers - The student will investigate one of the agriculture mechanics careers discussed and class and they will create a digital presentation outlining the components of the career. (Obj 11)

Class participation and assignments require and develop critical thinking.

1. Pig Tail Splice 1. Correctly remove insulation from three wires. Evaluate the wires, based on knowledge of the electrical code, and classify them for residential or commercial use. 2. Clean wires with a knife 3. Holding bare wire ends together, and

begin twisting all three wires together. Analyze which wires are more malleable than others. 4. Twist until windings are close to insulation 5. Solder to insure a good permanent splice (Obj 1, 8)

2. Running A Bead with SMAW 1. Secure a 1/4" x 4" x 6" piece of mild steel. 2. Turn on the welder and apply previous knowledge of the proper setting is for the machine. 3. Place a 1/8" E6013 electrode in the holder at 90 degrees. 4. Strike the arc and move the electrode to the starting point. 5. Watch the puddle, feed the electrode keeping the arc at about 1/8" above the metal. 6. Move from left to right across the pad. 7. Observe the angle of the electrode. 8. Run the bead until you reach the edge of your metal. 9. At the completion of your first bead, analyze your weld. What areas will you be working to improve upon for your next weld? 10. Repeat the process until you can strike the arc and run a good bead over and over again. (Obj 10)
3. Fitting Plastic Pipe 1. Cut off all burrs, inside and out, with a knife or a reamer. Clean the end of the pipe with a rag. 2. Do a trial fit of the pipe and fitting. If the pipe won't fit, file or sand it down. When the pipe and fitting go snugly together (not so loose that the fitting will fall off), remove the gloss on the outside of the pipe and on the inside of the fitting using fine sandpaper or a liquid cleaner made for the purpose. (Obj 1, 2, 5)

Methods of Evaluation:

- Written/Typed Homework
- Class Performance(s)
- Group Work
- Internet Research
- Quizzes/Exams
- Performance Exams
- Lab Reports

Texts, Readings, and Materials:

- **Textbooks**
  Ray V Herren *Agriculture Mechanics: Fundamentals & Applications* (7/e). Cengage Learning, (2015).