

# Lassen Community College Course Outline

## AGR 41 Farm Tractors and Farm Power

3.0 Units

### I. Catalog Description

The selection, use, application, operation, service, maintenance, adjustment, and handling minor repairs of wheel and track type farm tractors. Principles of operation of internal combustion engines will be taught through practical application.

**Recommended Preparation:** Successful completion of ENGL105 or equivalent assessment placement.

Transfers to CSU only

17 Hours Lecture

102 Hours Lab

Scheduled: Spring (odd)

### II. Coding Information

Repeatability: Not Repeatable, Take 1 Time

Grading Option: Graded or Pass/No Pass

Credit Type: Credit - Degree Applicable

TOP Code: 011600

### III. Course Objectives

#### A. Course Student Learning Outcomes

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

Perform all pre-inspection and operations of at least two different types of farm machinery.

#### B. Course Objectives

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

1. Demonstrate tractor safety.
2. Explain the steps for pre-inspection of your equipment.
3. Explain tractor and implement selection.
4. Select the appropriate tractor for a given job.
5. Demonstrate basic mechanical repairs.
6. Demonstrate tractor and equipment maintenance.
7. Demonstrate correct usage of tractor PTO.
8. Perform minor tractor repair.

### IV. Course Content

#### A. Safety Procedures

1. Pre-inspection
2. Hand signals
3. Hazards
4. Cal OSHA Regulation

#### B. Tractor Selection

1. Comparisons
2. Performance

3. Other comparative considerations
- C. Tests, Ratings and Standards
- D. Fundamentals of Tractor Performance
  1. Principles of operation of internal combustion engines
    - a. Conditions necessary for engine operation
    - b. Engine parts, systems and relationships
    - c. Fundamental engine terms and measurements
  2. Traction Applications
    - a. Weight in relationship to pulling ability
    - b. Methods of weighing
    - c. Increasing pull (torque)
  3. Power take-off and belt applications
- E. Tractor Applications
  1. Safety
  2. Hitching
  3. Field Operations
  4. Transporting
- F. Troubleshooting and Minor Repair
  1. Engine and engine accessories
    - a. Valves
    - b. Electrical and ignition
    - c. Fuel
    - d. Lubrication
    - e. Coolant
    - f. Engine tests
  2. Steering
  3. Power Transmission
    - a. Clutch
    - b. Transmission
    - c. Differential
    - d. Final Drive
  4. Hydraulic System
  5. Brakes
- G. Selecting the proper equipment to maximize production
- H. Tractor Management
  1. Fixed Costs
  2. Variable Costs
  3. Other considerations and variables
- I. Tractor Servicing and Maintenance
 

Preventative maintenance, servicing and adjusting:

  - a. Painting
  - b. Starting new tractors
  - c. Steering system
  - d. Tires
  - e. Tracks
  - f. Cooling systems
  - g. Fuel systems
  - h. Ignition system
  - i. Lubrication system
  - j. Power transmission system

- k. Hydraulic system
- l. Brake System

## V. Laboratory

1. Safety walk through (following the completion of the written safety test)
2. Diagnostics and problem solving
3. Tractor operations (track and wheel tractors)
4. Tractor and implements
5. Tractor maintenance and service

## VI. Assignments

### A. Appropriate Readings

Agricultural Mechanics Fundamentals and Application - Elmer L. Cooper, Delmar Publishers

### B. Writing Assignments

These will include recording of maintenance procedures, ordering of parts from manuals, and recording of hours and job accomplished.

### C. Expected Outside Assignments

These involve students discussing with specialists in farm mechanics possible solutions to problems, developing hypothesis to possible solutions to mechanical problems encountered but not yet solved, and observing equipment being used in Northeastern California noting productivity and efficiency. Written evaluations will be required.

### D. Specific Assignments that Demonstrate Critical Thinking

Students will demonstrate critical thinking by considering all basic mechanical information available in determining causes of mechanical malfunctions and by considering all prior operation experiences in determining the rough terrain abilities of a given piece of equipment.

## VI. Methods of Evaluation

- A. Student grades will be determined by demonstrating an ability to safely operate farm equipment.
- B. Student grades will be determined by correctly operating, maintaining, and repairing equipment as well as demonstrating correct equipment operation.

## VII. Methods of Delivery

Check those delivery methods for which, this course has been separately approved by the Curriculum/Academic Standards Committee.

Traditional Classroom Delivery     Correspondence Delivery

Hybrid Delivery     Online Delivery

Lecture and Demonstrations

## VIII. Representative Texts and Supplies

Required:

Deere, John, *Fundamentals of machinery operations: Tractor*, 5<sup>th</sup> edition, 2014, Deere & Co, ISBN – 13: 978-0866913515

Recommended:

Deere & Co., *Preventive Maintenance*, 2016, ISBN:-9780866914315.

**IX. Discipline/s Assignment**

Agricultural Engineering

**X. Course Status**

Current Status: Active

Original Approval Date: 2/27/1990

Revised By: Brian Wolf

Curriculum/Academic Standards Committee Revision Date: 05/03/2016