

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. This course has been approved for hybrid delivery.

Diversity Statement: Our commitment to diversity requires that we strive to eliminate barriers to equity and that we act deliberately to create a safe and inclusive environment where individual and group differences are valued and leveraged for the growth and understanding as an educational community.

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

Transfers to CSU only

17 Hours Lecture, 102 Hours Lab, 34 Out of Class hours, 153 Total Hours of Instruction

Scheduled: Spring (odd)

II. Coding Information

Repeatability: Not Repeatable, Take one 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:

1. 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 power take-off (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

Individual Laboratory Activities may include but are not limited to:

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

Appropriate readings may include-Fundamentals of machinery operations.

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

Traditional Classroom Evaluation

