# BUTTE COLLEGE
## COURSE OUTLINE

I. **CATALOG DESCRIPTION**

**AET 30 - Tractors and Crawlers** **3 Unit(s)**

**Prerequisite(s):** NONE
**Recommended Prep:** Reading Level IV; English Level III; Math Level II
**Transfer Status:** CSU
34 hours Lecture
51 hours Lab

This course covers design principles, selection, maintenance, adjustment, and safe operation of wheel and crawler type tractors used in agriculture and in the construction industry. (C-ID AG-MA 108L).

II. **OBJECTIVES**

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

A. List all the safety and operation rules for tractors and crawlers.
B. Operate wheel and track type tractors safely and properly.
C. Identify tractor parts and their function.
D. Describe power generation and transmission systems.
E. Select the proper equipment for a specific job.
F. Perform operator level maintenance and adjustment of tractor systems.
G. Diagnose and repair minor tractor problems.
H. Back a tractor and trailer through a course safely and accurately.
I. Attach implements to tractor safely and properly.
J. Communicate and work cooperatively with others.

III. **COURSE CONTENT**

A. **Unit Titles/Suggested Time Schedule**

Lecture

| Topics | Hours |
|---|---|
| 1. Introduction<br>a. History of the tractor engine<br>b. Types of tractors<br>c. Terminology | 5.00 |
| 2. 2. Safety<br>a. California division of industrial safety<br>b. Hand Signals<br>c. Starting and stopping<br>d. Hazards<br>e. Transportation<br>f. Cal OSHA regulations | 5.00 |
| 3. Power systems<br>a. Engine<br>b. Clutch<br>c. Transmissions<br>d. Final Drives<br>e. Hydraulic<br>f. P.T.O. | 5.00 |

| | | |
|---|---|---|
| | g. Electrical | |
| 4. | Controls<br>a. Starting and stopping<br>b. Steering<br>c. Hitches<br>d. Hydraulic<br>e. Electric<br>f. Auto Guidance | 5.00 |
| 5. | Implement<br>a. Attachment<br>b. Adjustments<br>c. Efficiency | 4.00 |
| 6. | Field operation<br>a. Ballast<br>b. Stability<br>c. Daily maintenance<br>d. Selecting speeds<br>e. Hazardous situations | 5.00 |
| 7. | Maintenance<br>a. Operators manuals<br>b. Tools<br>c. Supplies<br>d. Inspection, evaluation | 5.00 |
| Total Hours | | 34.00 |

Lab

| Topics | | Hours |
|---|---|---|
| 1. | Functionality of safety equipment | 5.00 |
| 2. | Proper application of electrical components | 3.00 |
| 3. | Performing up-to-date maintenance of lubrication points | 5.00 |
| 4. | Functionality of engine cooling and lubrication | 5.00 |
| 5. | Maintenance and assembled fittings of hydraulics | 5.00 |
| 6. | Proper inflation of tires | 3.00 |
| 7. | Proper adjustment of implement | 5.00 |
| 8. | Perform all pre-start procedures on a tractor | 5.00 |
| 9. | Safe operation of tractors and implements | 5.00 |
| 10. | Selection of the proper implement for the job | 5.00 |
| 11. | How to troubleshoot tractor problems | 5.00 |
| Total Hours | | 51.00 |

## IV. **METHODS OF INSTRUCTION**

A. Lecture
B. Instructor Demonstrations
C. Collaborative Group Work
D. Field Trips
E. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture

F. Discussion
G. Demonstrations
H. Reading Assignments
I. Multimedia Presentations
J. Laboratory (practical application)

## V. METHODS OF EVALUATION

A. Exams/Tests
B. Quizzes
C. Projects
D. Demonstration
E. Homework
F. Class participation
G. Final Examination
H. Written Assignments
I. Practical Evaluations

## VI. EXAMPLES OF ASSIGNMENTS

A. Reading Assignments
   1. Read the chapter on safety. Describe the proper technique for mounting and dismounting a tractor without falling off.
   2. Read assigned text chapter on power trains. Be prepared to describe the proper operation of the clutch.

B. Writing Assignments
   1. Use the Internet to research agricultural tires. Explain in a one-page paper the difference between an R1 tire and an R3 tire.
   2. Answer the essay questions on field patterns from this week's "Lab Howdy" and submit your answers to the instructor.

C. Out-of-Class Assignments
   1. Form a study group with your classmates to discuss transport safety. Questioning each other is an excellent method to enhance your learning and comprehension.
   2. Supplement your text reading with an on-line search for information about rubber-tracked tractors. Suggested sites are "How Stuff Works" and Wikipedia, or Google the topic you are researching.

## VII. RECOMMENDED MATERIALS OF INSTRUCTION

Textbooks:

A. Deere & Company. John Deere Fundamentals of Machine Operation-Tractors. 4th Edition. Moline Illinois, 2008.

Materials Other Than Textbooks:

A. Various equipment manuals checked out of mechanics shop.
B. Clothing appropriate for operating equipment, including sleeved shirt, long pants, closed toe shoes.

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