



Course Outline

2026-2027 Catalog

AET 36 - Heavy Equipment Operation

Catalog Description

Transfer Status: CSU

Corequisite: AET 35

Unit(s): 6.00

Lecture: 34.00 Contact hours/68.00 Out of class hours/102.00 Total hours/2.00 Unit(s)

Lab: 204.00 Contact hours/0.00 Out of class hours/204.00 Total hours/4.00 Unit(s)

Total: 238.00 Contact hours/68.00 Out of class hours/306.00 Total hours/6.00 Unit(s)

Course Description: This course covers selection, operation, service, and adjustment of heavy equipment used in agriculture and construction industries. Also covered are measurement and techniques used in preparing roads, building sites, and other projects as may be required in the field using heavy equipment.

Objectives

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

1. Select the proper equipment for a specific project.
2. Perform operator level maintenance and adjustment.
3. Write machine condition and use reports.
4. Operate wheel and track type equipment safely and properly.
5. Coordinate multiple machine operations.
6. Plan and lay out excavations using survey equipment.
7. Communicate and work cooperatively with others.
8. Practice proper operating techniques for specific machines.

Course Content

Topic Titles / Suggested Time Topic

Lecture

<u>Topics</u>	<u>Lec Hrs</u>
Introduction to Heavy Equipment Operation	4.00
Safety	2.00
Preoperation Checks, Reports, Controls	2.00
California Drivers License (CDL) and Truck Operations and Reports	2.00
Field Procedures (on and off campus)	2.00
Service Trucks and Equipment	2.00
Loader Operation	2.00
Backhoe/Loader Operation	2.00
Excavator Operation	2.00
Bulldozer Operation	2.00
Motor Grader Operation	2.00
Scraper Operation	2.00
Measurement and Laser Operation	2.00
Project Operation	6.00

Total Hours: 34.00

Lab

<u>Topics</u>	<u>Lab Hrs</u>
Introduction to Heavy Equipment Operation	12.00
Safety	6.00
Preoperation Checks, Reports, Controls	6.00
CDL and Truck Operation and Reports	6.00
Field Procedures (on and off campus)	6.00
Service Trucks and Equipment	6.00
Loader Operation	18.00
Backhoe/Loader Operation	18.00

<u>Topics</u>	<u>Lab Hrs</u>
Excavator Operation	18.00
Bulldozer Operation	18.00
Motor Grader Operation	18.00
Scraper Operation	18.00
Measurement and Laser Operation	18.00
Project Operation	36.00
Total Hours: 204.00	

Methods of Instruction

- A. Class Activities
- B. Collaborative Group Work
- C. Demonstrations
- D. Discussion
- E. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- F. Multimedia Presentations

Methods of Evaluation

- A. Homework
- B. Class participation
- C. Lab Projects
- D. Final Examination
- E. Performance Examinations
- F. Practical Evaluations
- G. Short papers

Examples of Assignments

Reading Assignments

1. Read machine operator's manual for 650J dozer and prepare to discuss the advantages and operation of the hydrostatic drive system.
2. Read operator's manual for Champion 710A motor grader. Diagram the operating controls as viewed from the operator's position. Prepare to discuss how you will familiarize yourself with the controls when you begin to operate the machine.

Writing Assignments

1. Procure the operator's manual for the Caterpillar 312 excavator from the service library. Properly and completely evaluate machine condition and properly complete maintenance documentation.
2. Develop with your lab partner a plan for completing Backhoe Project #3, 30 feet of trench, 2 feet deep, with a 2% sloped bottom. Specify which backhoe you will use, other equipment required, and the steps required, in their proper order and with an estimate of the time required for each.

Out-of-Class Assignments

1. Locate and diagram service points for each machine listed on the master log sheet, including engine oil, transmission and hydraulic oil, coolant, and battery location.
2. Draw machine controls for each machine listed on the master log sheet. Draw controls as viewed from the operator's position. Label each control and all its positions (e.g., Float, Down, Hold, and Up for the loader boom control).

Recommended Materials of Instruction

Other Learning Materials

Texts: Equipment Manufacturers' Operator Manuals

Minimum Qualifications

Agricultural Engineering
Agriculture (Masters Required)

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