

CATALOG INFORMATION

Dept and Nbr: AGMEC 50 Title: AG MACHINE/EQUIP SKILL
Full Title: Agricultural Machinery and Equipment Skills
Last Reviewed: 12/12/2023

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	3.00	Lab Scheduled	3.00	6	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	5.00		Contact Total	87.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable
Grading: Grade Only
Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:
Formerly:

Catalog Description:
Students will examine design principles, selection, maintenance, adjustment, and safe operation of wheel and track-type tractors used in the agriculture and construction industries. This course emphasizes proper techniques for the operation and service of common farm implements.

Prerequisites/Corequisites:

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: Students will examine design principles, selection, maintenance, adjustment, and safe operation of wheel and track-type tractors used in the agriculture and construction industries. This course emphasizes proper techniques for the operation and service of common farm implements. (Grade Only)
Prerequisites/Corequisites:
Recommended:

Limits on Enrollment:
Transfer Credit: CSU;
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area	Effective:	Inactive:
CSU GE:	Transfer Area	Effective:	Inactive:
IGETC:	Transfer Area	Effective:	Inactive:
CSU Transfer:	Transferable	Effective: Fall 2017	Inactive:
UC Transfer:		Effective:	Inactive:

CID:

Certificate/Major Applicable:

Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:

At the conclusion of this course, the student should be able to:

1. Select appropriate tractor and equipment for field jobs.
2. Demonstrate safe operation of tractors and common farm implements based on Operational Safety and Health Administration (OSHA) requirements.
3. Perform operator level inspection, maintenance, and adjustment of tractors and farm implements.

Objectives:

At the conclusion of this course, the student should be able to:

1. Operate wheel and track type tractors and other field vehicles safely and efficiently.
2. Demonstrate ability to communicate and work cooperatively with others.
3. Identify correct tractor parts and their terminology.
4. Summarize power generation and transmission systems.
5. Match tractors and farm implements to jobs.
6. Perform operator level inspection, maintenance, and adjustment of tractor systems.
7. Diagnose and repair minor tractor problems.
8. Demonstrate proficiency in tractor setup and adjustment.
9. Demonstrate proficiency in attaching equipment to the drawbar, three-point hitch, power take-off shaft, and auxiliary hydraulic outlets.
10. Demonstrate proficiency in the use of tractor controls.
11. Evaluate service records and set-up appropriate service plans.

Topics and Scope:

I. Introduction

- A. Overview of farm equipment
- B. History of the tractor engine
- C. Tractor types and configuration

- D. Tractor safety and accident prevention
- E. Tractor types and engine types
 - 1. Utility tractors
 - 2. Row crop tractors
 - 3. Orchard tractors
 - 4. Industrial tractors
 - 5. Garden tractors
 - 6. Rotary tiller (walk behind tractors)
 - 7. Implement carries
- F. Operating principles
- II. Tractor Safety
 - A. California division of industrial safety
 - B. Hand signals
 - C. Starting and stopping
 - D. Hazards
 - E. Transportation
 - F. Cal OSHA regulations
- III. Power Systems
 - A. Engine
 - B. Clutch
 - C. Transmission
 - D. Final drives
 - E. Hydraulic
 - F. Power Take-Off (PTO) shaft
- IV. Controls
 - A. Starting and stopping
 - B. Steering
 - C. Hitches
 - D. Hydraulic
 - E. Electric
 - F. Auto guidance
- V. Implement
 - A. Attachment
 - B. Adjustments
 - C. Efficiency
- VI. Field Operations
 - A. Pre-operation
 - 1. Ballast
 - 2. Stability
 - 3. Daily maintenance
 - 4. Selecting speeds
 - 5. Hazardous situations
 - B. Primary tillage
 - C. Fertilizing (pre-plant)
 - D. Seeding
 - E. Irrigating
 - F. Cultivating and mowing
 - G. Spraying and fertilizing (post-plant)
- VII. Tractor Operation Skills
 - A. Pre-starting maintenance and safety checks
 - 1. Starting the tractor engine
 - 2. Tractor driver responsibilities

- 3. Basic operating principles
 - B. Tractor movement
 - C. Implement hook-up and backup
- VIII. Maintenance and Repairs
 - A. Definition and importance of maintenance and repairs
 - B. Operator's manual
 - C. Maintenance and repair records
 - D. Engine tune-up
 - E. Service and adjustment to engines and equipment
 - F. Tools and supplies
 - G. Inspection and evaluation

All topics are covered in the lecture and lab portions of the course.

Assignment:

Lecture-Related Assignments:

1. Weekly reading (15 -20 pages)
2. Lab reports (2-10). Topics may include:
 - A. Pre-operation
 - B. Tractor & equipment operation and controls
 - C. Calibrations for fertilizing, seeding and spraying
 - D. Pre-evaluation of servicing requirements
 - E. Troubleshooting tractor systems
3. Quiz(zes) (1-6)
4. Exam(s) (1-3)

Lab-Related Assignments:

1. Weekly inspection/operation logs: Pre-operation and post operation
2. Service and maintenance inspection reports
3. Skill/performance exams: tractor and equipment operation

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Weekly inspection/operation logs

Writing 5 - 10%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Lab reports; service and maintenance inspection reports

Problem solving 20 - 40%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Skill/Performance exams

Skill Demonstrations 20 - 30%

Exams: All forms of formal testing, other than skill performance exams.

Quizzes; exams

Exams
30 - 40%

Other: Includes any assessment tools that do not logically fit into the above categories.

Attendance and participation

Other Category
0 - 10%

Representative Textbooks and Materials:

Agricultural Mechanics and Technology Systems. 2nd. Hancock, J.P. and Edgar, Don.
Goodheart-Willcox. 2022.

Fundamentals of Machine Operation: Tractors. 5th ed. Deere & Company Service Publications.
2014 (classic).

Fundamentals of Machine Operation: Preventive Maintenance. 8th ed. Deere & Company
Service Publications. 2015 (classic).

National Safe Tractor and Machinery Operation Program: Student Manual. 2nd ed. National
Safety Council. Hobar Publications. 2013 (classic).

Instructor prepared materials