

HARTNELL COLLEGE

COURSE OUTLINE

CC Approval: 04/20/2017

Board of Trustees:

Last Revised:

DESIGNATOR & NUMBER: MFGT 71COURSE TITLE: Agricultural and Industrial Equipment OperationCREDIT UNITS: 3FACULTY INITIATOR: Albert GrahamSEMESTER HOURS:

32.00 - 36.00	Lecture Contact Hours
48.00 - 54.00	Lab Contact Hours
0.00	Total Contact Hours
4.00	Total Out-of-Class Hours
0.00	Total Student Learning Hours

TOTAL CONTACT HOURS (BASED ON 16-18 WEEKS)

32.00 - 36.00	Lecture
48.00 - 54.00	Lab
0.00	By Arrangement Lab Hours (DHR)

GRADING BASIS:

Grade Only

PREREQUISITE:COREQUISITE:ADVISORY:OTHER:COURSE DESCRIPTION:

Design principles, selection, maintenance, adjustment, and safe operation of wheel and track type tractors used in agriculture and in the construction industry. Students will operate a variety of equipment. Principles and application of safety will be stressed. Includes field trips. Formerly AIT-71. Not open to students who have completed AIT-71 with a grade of "C" or better

COURSE OBJECTIVES:

Upon satisfactory completion of the course, students will be able to

1. operate wheel and track type tractors safely and properly.
2. demonstrate the ability to properly and safely connect working implements.
3. demonstrate ability to back equipment with a trailer attached.
4. identify correct tractor parts and their terminology.
5. describe power generation and transmission systems.
6. analyze a given situation and match the tractor and equipment to the job.
7. perform operator-level maintenance and adjustment of tractor systems.
8. inspect, diagnose, and repair minor tractor problems.
9. demonstrate ability to communicate and work cooperatively with others.

COURSE CONTENT:

- I. Introduction
 - A. History of the tractor engine
 - B. Types of agricultural and industrial equipment
 - C. Terminology
- II. Safety
 - A. California Division of Industrial Safety
 - B. ROPS (Rollover Protection Structure) and related equipment
 - C. Hand Signals
 - D. Starting and stopping
 - E. Hazards
 - F. Transportation
- III. Power systems
 - A. Engine
 - B. Clutch
 - C. Transmissions
 - D. Final Drives
 - E. Hydraulic
 - F. P.T.O. (Power Take Off)
 - G. Electrical
- IV. Controls
 - A. Starting and stopping
 - B. Steering
 - C. Hitches
 - D. Hydraulic
 - E. Electric
- V. Implements
 - A. Attachment methods and techniques
 - B. Adjustments
 - C. Efficiency and safety
- VI. Field operation
 - A. Ballast
 - B. Stability
 - C. Daily maintenance
 - D. Selecting speeds
 - E. Hazardous situations
- VII. Maintenance
 - A. Operators manuals
 - B. Proper care and use of tools
 - C. Supplies

D. Inspection, evaluation, and repairs

LAB CONTENT:

- I. Safety
 - A. personal
 - B. equipment
 - C. shop
- II. Operational checkout procedures
- III. Driving
 - A. solid tire equipment
 - 1. Two-wheel drive equipment
 - 2. Four-wheel drive equipment
 - B. pneumatic tire equipment
 - 1. Two-wheel drive equipment
 - 2. Four-wheel drive equipment
 - C. Tack equipment
- IV. Attaching and removing implements
 - A. 3 point hitch
 - B. PTO
 - C. draw bar
 - D. goose neck hitch
 - E. bumper pull hitch
- V. Pulling and reversing implements
 - A. 3 point hitch
 - B. draw bar
 - C. goose neck hitch
 - D. bumper pull hitch
- VI. Field operation
- VII. Transporting of equipment and implements
- VIII. Basic maintenance
- IX. Storage of equipment and implements

INSTRUCTIONAL METHODOLOGY:

- Lecture
- Lab Activity
- Individual Assistance
- Audiovisual (including PowerPoint or other multimedia)
- Demonstration
- Discussion
- Group Activity

Requires a minimum of three (3) hours of work per unit including class time and homework.

METHODS OF EVALUATING OBJECTIVES OR OUTCOMES:

Methods of evaluation to determine if students have met objectives may include, but are not limited to the following:

CLASSROOM	EXPLANATION
	Students will be expected to wear proper safety attire to each

Class Activity	class meeting, and participate during class discussion through sharing of ideas, asking questions that are pertinent to class content. This will make up 12%-25% of their grade.
Lab Activity	Each week students will be learning about a different equipment and how it is applied to industry. During the lab students will have to apply the information taught in lecture and demonstration and student operation of equipment, checking systems. The projects will build on each other. This will make up 40%- 50% of their grade.
Written Assignments	There will be weekly homework assignments. In the assignment students will have to learn industry terms and complete questions at the end of each chapter. This will make up 10%-12.5% of their grade.

EXAMS

EXPLANATION

Comprehensive Final	Students will have a comprehensive final which will include: essay, fill in the blank, multiple choice, short answers. This will make up 20%-25% of their grade.
Problem Solving	Explanation of possible solutions to equipment problems and applications, or related problems.
Skill Demonstration	Students will be able to demonstrate proper shop safety, operate equipment, connect implements and back equipment with a trailer attached. . The grade from skills demonstrations will be reflected in the lab activities.
Quizzes	Daily quizzes will be given about information that was presented in the previous class. This will make up 10%-12.5% of their grade.

MINIMUM STUDENT MATERIALS:

Textbook(s) similar to:

John Deere. *Fundamentals of Machine Operation: Tractors*. 5th Ed, John Deere Publishing, 2014

ADDITIONAL RESOURCES

- Safety glasses Z87.1
- Tan/khaki colored work shirt
- Work boots and appropriate clothing for shop

COURSE ASSIGNMENTS

Examples of Reading Assignments

Weekly readings from the textbook; approximately 20-30 pages per week.

Examples of Writing Assignments

Students will be assigned articles to read throughout the semester and write a response about the article and how it applies to the industry.

Examples of Outside Assignments

Weekly homework assignments that include completing review questions at the end of textbook chapters.

