Course Information Form (CIF)

Course Code: DPE 110

Course Title: Agricultural and Heavy Equipment Power Trains

Department: Agricultural Technologies
PCS Code: 1.2 - Occupational/Technical Instruction
CIP Code: 47.0302
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 2-2-3
Credit Hour Distribution:

Lecture: 2	Lab: 2	Clinical: 0	**Total: 3**

General Course Information

Catalog Description

Drive trains and components of agricultural machinery and construction/earth-moving equipment; special transmissions, clutch systems, transaxles, differentials, axles, and power take-off (PTO) units; troubleshooting, diagnosis, and repair.

General Course Objectives

- Learn operating principles of traction clutch systems.
- Learn theory and power flow through gear transmission.
- Learn theory and power flow through power shift transmissions.
- Learn theory and power flow through differentials, final drives, PTOs, and range gear cases.
- Learn proper transmission disassembly and reassembly skills following company manuals.

Minimum Placement Levels

English	Reading	Math
None	Placement into CCS 098	None

Prerequisites

Credit in DPE 133

Methods of Evaluation

Students will be given a minimum of 8 chapter quizzes, 2 unit exams, and 5 lab practicals.

Instructional Materials and Additional Supplies

Heavy Equipment Power Trains and Systems, 978-1-63563-228-6
Students will need the required tool set for the Diesel Power program.

Course Content

General Learning Outcomes (GLOs)

- Critical Thinking and Information Literacy: Students will demonstrate the ability to evaluate perspectives, evidence, and implications, and to locate, assess, and use information effectively.
- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.
- Technology: Students will demonstrate the ability to evaluate, select, and appropriately use current and emerging tools.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Principles and Power Flow Through Traction Clutches	1. Identify operating principles of all types of traction clutches. 2. Describe the power flow through clutches.	4	1	0
Theory and Power Flow Through Gear Transmissions	1. Identify theory and power flow of gear transmissions, gear reduction, gear ratios, counter shafts, and how reverse is done in a transmission.	8	2	0
Theory and Power Flow Through a Power Shift Transmission	1. Identify theory and power flow of a power shift transmission, how a planetary gear set works, how a clutch pack functions, and oil flow in a power shift transmission. 2. Describe power flow through planetary sets.	10	2	0
Differentials and Final Drives	1. Identify power flow through differentials and final drives, what ring and pinion gear ratios are, what gear backlash is, why final drives are used, and what tooth pattern is.	5	4	0
Disassembly and Reassembly	1. Disassemble, identify parts, and reassemble using special service tools a gear or power shift transmission, following company manuals. 2. Replace gears, shafts, and bearings. 3. Set bearing end play, bearing pre-load, and backlash.	0	18	0
Power Take Offs (PTO) and Range Boxes	1. Explain PTOs, including how to repair PTOs, how PTOs are part of a transmission, and power flow through range boxes.	3	3	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
30	30	0