Discipline: Agriculture	Sub-discipline: Mechanized Agriculture
General Course Title: **Power Trains**	Min. Units: **3 Semester**
	Proposed Suffix: **L**

Course Description:
Study of the power train from the clutch through the final drive. Topics will include the theory of operation, maintenance, diagnosis, and repair of torque converters, mechanical and hydraulic transmissions, differentials, and final drives. Safety will be stressed throughout. Laboratory required.

Required Prerequisites or Co-Requisites[1]

Advisories/Recommended Preparation[2]

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

- Demonstrate the knowledge and skills required in power train repair
- Explain the physics relating to friction, heat, gear design, fluids, hydraulics, electricity, lubrication, and stress distribution,
- Describe methods and procedural practices in servicing, diagnosis, and repair
- Demonstrate ability in evaluating malfunctions and recommending remedies
- Use technical references properly, including repair and parts manuals
- Demonstrate ability to communicate and work cooperatively with others

Course Content:

1. Clutch
   a. Clutch purpose as one element of the power flow schematic
   b. Dry-type clutch assemblies
   c. Oil-type clutch service and repair
   d. Dry-type clutch service and repair

2. Torque converter
   a. Applications, theory, and component parts
   b. Operating principles and precautions

3. Introduction to transmissions
   a. General power flow information
   b. Transmission design, component parts, functions, operating principles and disassembly

4. Transmission types
   a. Manual
   b. Power shift
   c. Hydrostatic

5. Differential
   a. Operation
   b. Differential locks
   c. Adjustments

Power Trains
(Content Continued)

[1] Prerequisite or co-requisite course need to be validated at the CCC level in accordance with Title 5 regulations; co-requisites for CCCs are the linked courses that must be taken at the same time as the primary or target course.

[2] Advisories or recommended preparation will not require validation but are recommendations to be considered by the student prior to enrolling.

6. Final drive
   a. Straight axle
   b. Pinion drives
   c. Planetary drives

7. Power train service, diagnosis, and repair

Laboratory Activities: Individual Laboratory Activities are designed to support course objectives.

Methods of Evaluation: Lecture	Methods of Evaluation: Laboratory
Comprehensive Quizzes and Exams Written Critical Thinking Scenarios Problem Analysis and Solution Research and Term Papers	Laboratory Skill Validation by Observation Laboratory Reports Diagnostics and Problem Solving Laboratory Skill Practicum Certification Exams

Typical Textbooks, Manuals, or Other Support Materials

Power Trains, John Deere

Statewide Articulation: Transfers as lower division elective

FDRG Lead Signature: Date:

Mark E. Bender, PhD CSU Stanislaus

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