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

Course Description:
This course explores the operation and repair of modern diesel engines. Principles and theories are studied by running, testing, diagnosing, disassembling and reassembling components, systems and engines. 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:*

- Communicate basic diesel engine principles used on compression ignition engines
- Measure serviceable engine components and compare data to manufacturers specifications
- Select and order engine parts using manufacturers parts systems
- Disassemble, inspect, adjust, reassemble a diesel engine as part of a team
- Demonstrate troubleshooting and tune up techniques
- Successfully start, operate and evaluate the final condition of a diesel engine
- Demonstrate ability to communicate and work cooperatively with others

Course Content:

1. Introduction to Diesel Engines
   a. History and development of diesel engines
   b. Comparison of diesel and gas engines
   c. Engine oil and diesel fuel
   d. Cycle operations/combustion chamber
   e. Basic engine components
   f. Engine disassembly

2. Engine Management
   a. Safety
   b. Parts selection
   c. Parts ordering

3. Diesel Engine Components and Service
   a. Cylinder block description and servicing procedures
   b. Crankshaft and main bearings
   c. Flywheel and vibration damper
   d. Pistons, rings and connecting rods
   e. Camshaft and timing gear train
   f. Cylinder head and valves

4. Air Intake and Exhaust system
   a. Naturally aspirated engines
   b. Turbocharged engine
   c. Blower engines
   d. Engine brakes

Diesel Engines
(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.

5. Cooling Systems
   a. Coolant and conditioner
   b. System components
   c. Recommended P.M.
   d. Tests/Troubleshooting

6. Lubrication Systems
   a. Components
   b. Filters
   c. Recommended P.M.
   d. Testing

7. Fuel Injection Systems
   a. Governors
   b. Injection principles
   c. Nozzles
   d. Timing

8. Electrical Systems
   a. Basic electrical components
   b. Starting and charging systems
   c. Electrical systems diagnostics

9. Troubleshooting Diesel Engines
   a. Proper starting procedures
   b. Engine dynamometers
   c. Engine diagnosis

d. Tune-up procedures

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

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

Typical Textbooks, Manuals, or Other Support Materials

Diesel Mechanics, Shultz

Statewide Articulation: CSUF-MEAG 113*, UCD-ABT 101, other universities as lower division elective (*Upper division subject matter equivalency, lower division elective units)

FDRG Lead Signature: Date:

Mark E. Bender, PhD CSU Stanislaus

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