



AGTC 126: AG POWER EQUIPMENT ELECTRONICS

Proposer:

Name:	Email:
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Effective Term:

Spring 2025

Credit Status:

Credit - Degree Applicable

Subject:

AGTC - Agricultural Technology

Course Number:

126

Discipline:

And/Or	(Discipline)
	(Agricultural Engineering (Equipment and machinery, farm mechanics))
Or		Agricultural Production (Animal science, plant science, beekeeping, aquaculture))

Catalog Title

Diesel Engine Emission Systems

Catalog Description

This course will teach student the fundamentals of fuel systems and emission systems used in diesel engines. Students will go in depth into the fuel delivery system found on tractors and other agriculture machinery. They will also learn about Tier 4 emission regulations and the emission system components found on both Tier 4 Interim and Tier 4 Final engines and how to service those systems.

Method of Instruction:

Laboratory
Lecture and/or Discussion

Course Units/Hours:

Course Units Minimum:

2

Lecture Hours Minimum (week)

2

Lab Hours Minimum (week)

1

Total Contact Hours Minimum (semester)

52.5

Total Outside Hours Minimum (semester)

70

Total Student Learning Minimum Hours (semester)

122.5



Repeatability:

No

Open Entry/Exit:

No

Field Trips:

Not Required

Grade Mode:

Standard Letter

TOP Code:

011600 - * Agricultural Power Equipment Technology

SAM Code:

C - Clearly Occupational

Course Content

Methods of Assessment:

- Multiple choice tests
- Problem solving assignments or activities
- Problem solving quizzes or exams
- Project
- Skill demonstrations

Course Topics:

Course Topics	
1	Diesel Fuel and Its properties
2	Diesel Fuel Delivery Systems HEUI Systems, Common Rail Systems and Line-Pump Systems
3	Injection Nozzles and Unit Injectors; mechanical, electrical and hydraulic
4	Injection Pumps: line pumps, distributor and common rail
5	Diesel Emission Regulations
6	Diesel Oxidation Catalyst
7	Diesel Particulate Filter
8	Selective Catalytic Reduction System
9	Regeneration Process

Course Objectives:

Course Objectives	
1	Identify all fuel system components their function and safety issues related to them
2	Perform a basic visual exhaust color analysis.
3	Remove, inspect and reinstall fuel and emission components
4	Perform basic maintenance and diagnosis of the fuel delivery system using OEM software.
5	Replace and time various injection pumps including inline, distributor and unit injectors along with high pressure common rail using correct OEM bleed down procedures.
6	Locate and test fuel system sensors
7	Measure fuel pressure and volume with correct diagnostic tools and compare to OEM specification.

**Course Outcomes:**

Course Outcomes	
1	Students will be able to remove inspect and replace fuel and emission system components.
2	Students will be able to perform basic maintenance tasks related to the fuel and emission systems.
3	Students will be able to perform basic troubleshooting and diagnosis of fuel and emission system problems.

Assignments:

Assignment Type:	Details
Reading	Students will read service procedures to service a fuel injector
Writing	Students will write service reports to be used by a service manager.
Lab	Students will use OEM software to diagnose an aftertreatment problem
Homework	Students will complete an online dealer training course.

Textbooks or other support materials

Resource Type:	Details
Books	Fundamentals of Mobile Heavy Equipment First Edition, Owen C Duffy ISBN 9781284112917 Copyright 2019
Web/Other	Original Equipment Manufacturer product databases.

Equity Review:

Yes

Transferable to CSU

Yes - Proposed

Transferable to CSU Justification

Transfer Policy Justification 2a and 2b

2a. The diesel fuel and emission systems are complex components of the modern diesel engine. Students will have to learn/ understand the complex chemistry that is be used to reduce diesel emissions to basically Nitrogen and Water coming out of the tail pipe of the diesel engine. Students will have to understand the basics of hydrocarbons, their breakdown process and the components leftover and how the emission system deals with those. The fuel delivery system is a complex part of the diesel engine too as its job is to precisely deliver atomized fuel to the combustion chamber at the right time in the right amount. There are many physics properties students will learn when learning about the diesel fuel delivery system.

2b. This course takes students well above the entry level of a technician. Many times employers have to send employees to training specifically in electrical and electronics. The skills learned in this course would be very valuable to students as they would come into the jobsite with advanced training. The theories and skills that are learned and practiced in this course allow students to take laws and theories and apply them to a real life situation. The students are not only learning the theoretical piece but then have to take the theoretical piece and apply it for real world results as expected by an employer.

This course will also be proposed for UC transfer.

No

Other Degree Attributes

Degree Applicable

Not a Basic Skills Course

Banner Title:

Ag Power Equipment Electronics