DET 89 Course Outline as of Spring 2002

CATALOG INFORMATION

Dept and Nbr: DET 89 Title: HEAVY DUTY ELECTRICAL
Full Title: Heavy Duty Equipment Electrical Systems
Last Reviewed: 1/22/2018

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	5.00	8	Lecture Scheduled	40.00
Minimum	3.00	Lab Scheduled	3.00	8	Lab Scheduled	24.00
		Contact DHR	0		Contact DHR	0
		Contact Total	8.00		Contact Total	64.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 80.00 Total Student Learning Hours: 144.00

Title 5 Category:	AA Degree Applicable
Grading:	Grade Only
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	DET 65

Catalog Description:
Principles of operation of electrical and electronic components and systems as related to heavy agricultural and industrial machinery and vehicles. Practical experiences in analyzing, measuring, and troubleshooting electrical/electronic circuitry.

Prerequisites/Corequisites:

Recommended Preparation:
AUTO 56.

Limits on Enrollment:

Schedule of Classes Information:
Description: Principles of operation of electrical and electronic components and systems as related to heavy agricultural and industrial machinery and vehicles. Practical experience in analyzing, measuring, and troubleshooting electrical/electronic circuitry. (Grade Only)
Prerequisites/Corequisites:
Recommended: AUTO 56.
Limits on Enrollment:

Transfer Credit: CSU;
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**			Effective:	Inactive:
CSU GE:	**Transfer Area**			Effective:	Inactive:
IGETC:	**Transfer Area**			Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Fall 1981	Inactive:	Fall 2014
UC Transfer:		Effective:		Inactive:	

CID:

Certificate/Major Applicable:
Certificate Applicable Course

COURSE CONTENT

Outcomes and Objectives:
Upon successful completion of this course students will be able to:
1. Explain the fundamentals of AC, DC, series and parallel circuits.
2. Read and interpret schematic diagrams.
3. Construct and analyze electrical circuits from schematic diagrams.
4. Properly use diagnostic tools related to the analysis and repair of heavy machinery and vehicle electrical systems.
5. Identify, locate, and describe electronic components and microprocessors as they are used in heavy equipment.
6. Distinguish between open circuits, short circuits and shorts to ground in electrical circuit systems.
7. Test, diagnose, and repair electrical and electronic circuits and components related to diesel equipment.
8. Discuss and apply personal, shop, and environmental safety procedures.

[Outcomes and objectives meet or exceed NATEF Applied Academic & Workplace Skills for Medium/Heavy Truck Technicians (Reference Standard 6.5, ASE Program Certification Standards manual, 1998.)]

Topics and Scope:

Unit 1: Review:
- laws and theory
- diagnostic tools (VOM)
- direct current
- alternating current

Unit 2: Symbols and Diagrams:
- approved electrical symbols
- use, development, and alteration of schematic diagrams

Unit 3: Series and Parallel Circuits:
- series circuits use

parallel circuits use
series-parallel circuit use
Unit 4: Repair of Components:
starters
alternators/generators
lighting circuits
switches and relays
harnesses and ECM's
Unit 5: Electronic Components and Microprocessors:
sensors/monitors
controllers
heavy vehicle applications
industrial applications
agricultural applications
electronic fuel systems
mobile electronic communications
Unit 6: Testing, Diagnosis, and Repair:
using test equipment
diagnostic procedures and manuals
repair of electronic circuitry
Unit 7: Safety
personal
shop
environmental

Assignment:

Students will:
1. Review and practice electrical theory exercises
2. Use diagnostic tools to test systems
3. Identify and use symbols in an electrical circuit
4. Draw schematics with series and parallel circuits
5. Locate faults in electrical circuits
6. Repair components in a system
7. Locate and test electronic components
8. Follow diagnostic procedures dictated by manufacturers

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments and skill demonstrations are more appropriate for this course.	Writing 0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, Lab reports	Problem solving 10 - 25%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Class performances	Skill Demonstrations 20 - 60%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, True/false, Matching items	Exams 20 - 60%

Other: Includes any assessment tools that do not logically fit into the above categories.

Attendance and participation.	Other Category 10 - 20%

Representative Textbooks and Materials:
Electrical, Fundamentals of Service, Deere & Co., 7th Ed. 1993