

CATALOG INFORMATION

Dept and Nbr: DET 189

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	2.25	17.5	Lecture Scheduled	39.38
Minimum	3.00	Lab Scheduled	2.25	8	Lab Scheduled	39.38
		Contact DHR	0		Contact DHR	0
		Contact Total	4.50		Contact Total	78.75
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 78.75

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As: AGMEC 89

Formerly: DET 89

Catalog Description:
Principles of operation of electrical and electronic components and systems used in trucks, construction and agricultural equipment. Introduction to electronic control systems.

Prerequisites/Corequisites:

Recommended Preparation:
Eligibility for ENGL 100 or ESL 100 and Course Completion of DET 179

Limits on Enrollment:

Schedule of Classes Information:
Description: Principles of operation of electrical and electronic components and systems used in trucks, construction and agricultural equipment. Introduction to electronic control systems.
(Grade Only)
Prerequisites/Corequisites:
Recommended: Eligibility for ENGL 100 or ESL 100 and Course Completion of DET 179
Limits on Enrollment:
Transfer Credit:

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:		Effective:	Inactive:
UC Transfer:		Effective:	Inactive:

CID:

Certificate/Major Applicable:

Both Certificate and Major Applicable

COURSE CONTENT

Outcomes and Objectives:

Upon successful completion of this course students will be able to:

1. Explain the fundamentals of alternating current (AC), direct current (DC), series and parallel circuits.
2. Read and interpret schematic diagrams.
3. Evaluate electrical circuits from schematic diagrams.
4. Properly use diagnostic tools related to the analysis and repair of electrical systems.
5. Identify, locate, and analyze electronic components and microprocessors.
6. Test, diagnose, and repair electrical and electronic circuits and components.
7. Discuss and apply personal, shop, and environmental safety procedures.

Topics and Scope:

1. Review:
 - a. laws and theory
 - b. diagnostic tools
 - c. direct current
 - d. alternating current
2. Symbols and Diagrams:
 - a. electrical symbols
 - b. use of schematic diagrams
3. Series and Parallel Circuits:
 - a. series circuits
 - b. parallel circuits
 - c. series-parallel circuit
4. Testing and Repair of Components:
 - a. battery testing
 - b. starters
 - c. alternators/generators
 - d. lighting circuits
 - e. switches and relays

- f. harnesses and ECM's
- 5. Electronic Components and Microprocessors:
 - a. sensors/switches
 - b. electronic control modules
 - c. actuators
 - d. diagnosis with scanner
- 6. Testing, Diagnosis, and Repair:
 - a. using test equipment
 - b. diagnostic procedures and manuals
 - c. repair of electronic circuitry
- 7. Safety
 - a. personal
 - b. shop
 - c. environmental

Assignment:

- 1. Reading - 25 pages a week
- 2. Evaluate batteries and starting systems, complete written reports
- 3. Test and analyze charging systems, complete written reports
- 4. Disassemble, inspect and reassemble starters and alternators
- 5. Test an electronic control system
- 5. 2-5 exams

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.

Starting and charging system reports

Writing
0 - 20%

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

Starting and charging system diagnosis

Problem solving
10 - 25%

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

Starter and alternator inspection, test electronic controls

Skill Demonstrations
10 - 25%

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

2 to 5 exams

Exams
45 - 65%

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

None

Other Category
0 - 0%

Representative Textbooks and Materials:

Heavy Duty Truck Systems, Sean Bennett, Ian Andrew Norman, Thompson Delmar Learning.
5th edition, 2010