

**DET 89 Course Outline as of Fall 2009****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	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 65

**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 80

**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 80

Limits on Enrollment:

Transfer Credit: CSU;

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

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>		Effective:	Inactive:	
<b>CSU GE:</b>	<b>Transfer Area</b>		Effective:	Inactive:	
<b>IGETC:</b>	<b>Transfer Area</b>		Effective:	Inactive:	
<b>CSU Transfer:</b>	Transferable	Effective:	Fall 1981	Inactive:	Fall 2014
<b>UC Transfer:</b>		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. Complete lab reports
3. Structured lab exercises
  - a. Review and practice electrical theory exercises
  - b. Use diagnostic tools to test systems
  - c. Identify and use symbols in an electrical circuit
  - d. Draw schematics with series and parallel circuits
  - e. Locate faults in electrical circuits
  - f. Repair components in a system
  - g. Locate and test electronic components
  - h. Follow diagnostic procedures dictated by manufacturers
  - i. Disassemble, inspect and reassemble electric components.
4. Homework problems
5. 2-5 written 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.

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.

Structured Lab Exercises

Skill Demonstrations  
20 - 60%

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

Multiple choice, Short answer

Exams  
20 - 60%

**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. 4th edition, 2006