

CATALOG INFORMATION

Dept and Nbr: DET 184                      Title: MOBILE HYDRAULIC SYSTEMS  
Full Title: Mobile Hydraulic 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:  
Formerly:                      DET 84

**Catalog Description:**  
Study of the theory, application and component parts of hydraulic systems. Emphasizes fundamentals in inspection, troubleshooting and repair of hydraulic components commonly used in agricultural and construction equipment.

**Prerequisites/Corequisites:**

**Recommended Preparation:**  
Eligibility for ENGL 100 or ESL 100;  
and Course Completion of DET 179 and IED 190

**Limits on Enrollment:**

**Schedule of Classes Information:**  
Description: Study of the theory, application and component parts of hydraulic systems. Emphasizes fundamentals in inspection, troubleshooting and repair of hydraulic components commonly used in agricultural and construction equipment. (Grade Only)  
Prerequisites/Corequisites:  
Recommended: Eligibility for ENGL 100 or ESL 100;

and Course Completion of DET 179 and IED 190

Limits on Enrollment:

Transfer Credit:

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

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

<b>AS Degree:</b>	<b>Area</b>	<b>Effective:</b>	<b>Inactive:</b>
<b>CSU GE:</b>	<b>Transfer Area</b>	<b>Effective:</b>	<b>Inactive:</b>
<b>IGETC:</b>	<b>Transfer Area</b>	<b>Effective:</b>	<b>Inactive:</b>
<b>CSU Transfer:</b>		<b>Effective:</b>	<b>Inactive:</b>
<b>UC Transfer:</b>		<b>Effective:</b>	<b>Inactive:</b>

**CID:**

**Certificate/Major Applicable:**

Both Certificate and Major Applicable

## **COURSE CONTENT**

### **Student Learning Outcomes:**

At the conclusion of this course, the student should be able to:

1. Understand and interpret hydraulic schematics and repair manuals in correlation to hydraulic systems.
2. Demonstrate ability to diagnose and repair hydraulic systems on agricultural and construction equipment.

### **Objectives:**

At the conclusion of this course, the student should be able to:

1. Explain the operating principles of fluid power systems.
2. Apply the nomenclature of hydraulics and use and interpret the proper symbols.
3. Identify and assess hydraulic system components.
4. Examine and evaluate hydraulic components.
5. Replace components in the system and test for proper operation.
6. Interpret instructions and repair manuals to diagnose systems, perform basic repair and maintenance.
7. Discuss and apply personal, shop, and environmental safety procedures.

### **Topics and Scope:**

- I. Fundamentals of Hydraulics
  - A. Hydraulic principles and laws
  - B. Organizational bodies Governing industrial standards
  - C. Safety concerns related to hydraulic systems
- II. Hydraulic Components - Principles of Operations
  - A. Types and application of hydraulic systems
  - B. Operating principles of basic systems
  - C. Calculations of cycle times and horsepower

- III. Hydraulic Reservoirs
- IV. Hydraulic Pumps
  - A. Gear pumps
  - B. Vane Pumps
  - C. Piston Pumps
  - D. Diagnosis and common causes of failure
- V. Hydraulic Valves
- VI. Hydraulic Actuators
- VII. Hydraulic Fluids and Conditioners
- VIII. Hydraulic Conductors and Connectors
  - A. Hydraulic lines
  - B. Hydraulic hoses
  - C. Hydraulic connectors and quick couplers
- IX. Hydraulic Accumulators and Accessories
  - A. Accumulators
  - B. Oil coolers
  - C. Oil Heaters
- X. Hydrostatic Drives
- XI. Advanced Hydraulics
  - A. Open center systems
  - B. Closed center systems
  - C. Variable displacement pump controls
  - D. Load sensing pumps
  - E. Pressure and flow compensated systems
  - F. Hydraulic pilot control systems
  - G. Electronically managed systems
- XII. Graphic Symbols and Schematics
- XIII. Preventive Maintenance
- XIV. Troubleshooting and Diagnostics

All topics are covered in both the lecture and lab parts of the course.

### **Assignment:**

Lecture-Related Assignments:

1. Read 25 to 50 pages a week
2. Ten to fifteen exams including final

Lab-Related Assignments:

1. Complete force, area and pressure calculation worksheets
2. Daily work logs (work assigned, work completed)
3. Disassemble, evaluate and reassemble components
4. Complete AED (Aftermarket Equipment Distributors) or NATEF (National Automotive Technicians Education Foundation) recommended task sheets

### **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.

Daily work log	Writing 0 - 25%
<b>Problem Solving:</b> Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.	
Force, area and pressure calculations	Problem solving 10 - 25%
<b>Skill Demonstrations:</b> All skill-based and physical demonstrations used for assessment purposes including skill performance exams.	
AED or NATEF Task sheets; Disassemble, evaluate and reassemble components	Skill Demonstrations 10 - 25%
<b>Exams:</b> All forms of formal testing, other than skill performance exams.	
Exams including final	Exams 40 - 50%
<b>Other:</b> Includes any assessment tools that do not logically fit into the above categories.	
None	Other Category 0 - 0%

### **Representative Textbooks and Materials:**

Fundamentals of Mobile Heavy Equipment CDX. Wright, Gus and Duffy, Owen and Heard, Scott. Jones and Bartlett. 2019

Fundamentals of Medium/Heavy Duty Commercial Vehicle Systems. Duffy, Owen and Wright, Gus. Jones and Bartlett. 2016

Instructor prepared materials