ATL 290 Course Outline as of Fall 2024

CATALOG INFORMATION

Dept and Nbr: ATL 290 Title: MOBILE HYDRAULIC SYSTEMS
Full Title: Mobile Hydraulic Systems
Last Reviewed: 12/4/2023

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	2.50	17.5	Lecture Scheduled	43.75
Minimum	3.00	Lab Scheduled	1.50	8	Lab Scheduled	26.25
		Contact DHR	0		Contact DHR	0
		Contact Total	4.00		Contact Total	70.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 87.50 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:	

Catalog Description:
Students will study the theory, application, and component parts of hydraulic systems. This course emphasizes fundamentals in inspection, troubleshooting, and repair of hydraulic components commonly used in agricultural and construction equipment.

Prerequisites/Corequisites:
Course Completion of ATL 101 and Concurrent Enrollment in ATL 161

Recommended Preparation:
Eligibility for ENGL 1A or equivalent and MATH 25 or equivalent

Limits on Enrollment:

Schedule of Classes Information:
Description: Students will study the theory, application, and component parts of hydraulic systems. This course emphasizes fundamentals in inspection, troubleshooting, and repair of hydraulic components commonly used in agricultural and construction equipment. (Grade Only)
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Recommended: Eligibility for ENGL 1A or equivalent and MATH 25 or equivalent

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

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Describe and interpret hydraulic schematics and repair manuals in relation to hydraulic systems.
2. Demonstrate ability to diagnose and repair hydraulic systems on agricultural and instruction 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
XV. Safety
   A. Personal
   B. Shop
   C. Environmental

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

Assignment:

Lecture-Related Assignments:
1. Weekly reading (25-75 pages)
2. Weekly chapter tests
3. Final exam

Lab-Related Assignments:
1. Hydraulic system related lab projects
2. Industry-based task sheets
3. Daily work logs (work assigned, work completed) if assigned by instructor

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 logs	Writing 0 - 20%

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

Industry-based task sheets	Problem solving 10 - 30%

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

Hydraulic system related lab projects	Skill Demonstrations 10 - 30%

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

Chapter tests; final exam	Exams 40 - 50%

Other: 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. 2nd ed. Wright, Gus, and Duffy, Owen and Heard, Scott. Jones and Bartlett. 2023.
Fundamentals of Medium/Heavy Duty Commercial Vehicle Systems. 2nd ed. Duffy, Owen and Wright, Gus. Jones and Bartlett. 2020.
Instructor prepared materials