



COURSE OUTLINE

MPF125

Prepared: George Parsons Approved: Corey Meunier

Course Code: Title	MPF125: FLUID POWER SYSTEMS
Program Number: Name	4041: AUTOMOTIVE REPAIR
Department:	MOTIVE POWER
Semester/Term:	18W
Course Description:	<p>Upon successful completion of this course, Fundamentals of Fluid Power Systems, you will be able to perform basic calculations of pressure, force and area using Imperial and System International (S.I.) measurement, be able to interpret basic hydraulic systems schematics and symbols, explain the operation of hydraulic components and be able to describe the different types of hydraulic fluids and their applications. The student will also be able to describe the inspection and testing procedures for hydraulic conductors and fittings and describe a regular scheduled maintenance service following manufacturers recommendations. The student will also be able to locate and identify the major components of a hydraulic system and perform leak and pressure tests.</p> <p>Students will be required to follow proper safety procedures when performing the above tasks according to both Sault College Motive Power Department Standards and Vehicle Manufacturers safety regulations and specifications.</p>
Total Credits:	1
Hours/Week:	4
Total Hours:	32
Vocational Learning Outcomes (VLO's): Please refer to program web page for a complete listing of program outcomes where applicable.	<p>4041 - AUTOMOTIVE REPAIR</p> <p>#1. Identify basic motive power system problems by using critical thinking skills and strategies and by applying fundamental knowledge of motor vehicle operation, components, and their interrelationships.</p> <p>#7. Use a variety of test equipment to assess basic electronic circuits, vehicle systems, and subsystems.</p> <p>#8. Apply basic knowledge of hydraulics and pneumatics to the testing and inspection of basic motive power systems and subsystems.</p> <p>#9. Communicate information effectively, credibly, and accurately by producing supporting documentation to appropriate standards.</p> <p>#10. Use information technology and computer skills to access data concerning repair procedures and manufacturer's updates.</p> <p>#11. Prepare logs, records, and documentation to appropriate standards.</p>

<p>Essential Employability Skills (EES):</p>	<p>#12. Apply business practices and communication skills to improve customer service.</p> <p>#1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience. #2. Respond to written, spoken, or visual messages in a manner that ensures effective communication. #3. Execute mathematical operations accurately. #4. Apply a systematic approach to solve problems. #5. Use a variety of thinking skills to anticipate and solve problems. #6. Locate, select, organize, and document information using appropriate technology and information systems. #7. Analyze, evaluate, and apply relevant information from a variety of sources. #8. Show respect for the diverse opinions, values, belief systems, and contributions of others. #9. Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals. #10. Manage the use of time and other resources to complete projects. #11. Take responsibility for ones own actions, decisions, and consequences.</p>
<p>Course Evaluation:</p>	<p>Passing Grade: 50%, D</p>
<p>Other Course Evaluation & Assessment Requirements:</p>	<p>V. EVALUATION PROCESS/GRADING SYSTEM: The final grade for this course will be based on the results of classroom, assignments and shop evaluations weighed as indicated: Classroom 35% of the final grade is comprised of term tests Assignments 10% of the final grade is comprised of a number of technical reports Shop 45% of the final grade is comprised of attendance, punctuality, preparedness, student ability, work organization and general attitude Employability Skills 10% of final grade is comprised of attendance, class participation, show ability to follow direction and being a team player.</p> <p>(Student will be given notice of test and assignment dates in advance)</p> <p>NOTE: All assignments will be in typed format. NO hand written assignments will be accepted.</p> <p>The following semester grades will be assigned to students:</p> <p>Grade Definition Grade Point Equivalent A+ 90 100% 4.00 A 80 89% B 70 - 79% 3.00 C 60 - 69% 2.00 D 50 59% 1.00 F (Fail) 49% and below 0.00</p> <p>CR (Credit) Credit for diploma requirements has been awarded. S Satisfactory achievement in field /clinical placement or non-graded subject area. U Unsatisfactory achievement in field/clinical placement or non-graded subject area. X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course. NR Grade not reported to Registrar`s office.</p>

W Student has withdrawn from the course without academic penalty.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Employability Skills	10%
Shop	45%
Theory Assignments	10%
Theory Tests	35%

Books and Required Resources:

Heavy Duty Truck Systems by Bennett
Publisher: Cengage Learning Edition: 6th

Course Outcomes and Learning Objectives:

Course Outcome 1.

Explain the fundamentals of hydraulic systems.

Learning Objectives 1.

- Pascal's Law
- Boyle's Law
- Charles's Law
- Gay-Lussac's Law
- Bernoulli's Principle

Describe hydraulic terms and applications.

- Hydrostatics
- Hydrodynamics
- Positive and negative pressures
- Fluid power leverage

Perform calculations for pressure, force and area using the following systems:

- Imperial
- system international unites (s.i.)

Course Outcome 2.

Identify the components and graphic symbols.

Learning Objectives 2.

- reservoir (filters and lines)
- pumps and compressors
- valves (pressure, volume and directional control)
- actuators (rotary and linear)

Describe the features, composition, types, and application of schematics for hydraulic systems.

- explain and interpret manufacturer's schematic legends

Perform basic circuit drawings using graphic symbols.

Course Outcome 3.

Explain the fundamentals of hydraulic components.

Learning Objectives 3.

Pumps

- gear
- vane
- piston
- pressure relief valves
- directional control valves
- volume control valves
- linear actuators
- rotary actuators
- vented and pressurized reservoirs

Identify the construction features, types, and styles of hydraulic components.

- gear pumps
- vane pumps
- piston pumps
- pressure relief valve
- directional control valve
- volume control valve
- linear actuators
- vented and pressurized reservoirs

Describe the principles of operation of hydraulic components.

- gear pumps
- vane pumps
- piston pumps
- pressure relief valve
- directional control valve
- volume control valve
- linear actuators
- vented and pressurized reservoirs

Identify and locate hydraulic components on basic systems using schematics, physically on a piece of equipment.

Course Outcome 4.

Explain the purpose and fundamentals of hydraulic fluids pertaining to:

Learning Objectives 4.

- power transfer medium
- lubrication
- cooling

Identify the composition and properties of hydraulic fluids pertaining to:

- viscosity
- fire supporting (volatility and flammability)
- fire retarding

Describe the function and construction features of hydraulic fluid filters.

- surface types
- depth types

Course Outcome 5.

Explain the purpose of hydraulic conductors and connectors including lines, pipes, fittings and pipes and tubing.

Learning Objectives 5.

Identify the construction features, types, and application of conductors and connectors.

- Standard, British and Metric fitting

Demonstrate the fabrication, inspection, and testing procedures following manufacturers` recommendations for hydraulic conductors and connectors.

- identify the risks of fluid injection into the skin

Course Outcome 6.

Explain the fundamentals of regular hydraulic system maintenance service.

Learning Objectives 6.

Demonstrate maintenance procedures following manufacturers` recommendations for hydraulic systems.

Date:

Monday, December 18, 2017

Please refer to the course outline addendum on the Learning Management System for further information.