COURSE OUTLINE

MPF122

Prepared: Dan Tregonning Approved: Corey Meunier

Course Code: Title	MPF122: BRAKES
Program Number: Name	4041: AUTOMOTIVE REPAIR
Department:	MOTIVE POWER
Semester/Term:	18W
Course Description:	This course deals with the study and interrelationship of essential basic fundamentals, composition, construction and operating principles of hydraulic and pneumatic brake systems. The student will also inspect and service hydraulic and pneumatic brake assemblies using manufacturer`s maintenance procedures. 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.
Total Credits:	4
Hours/Week:	8
Total Hours:	56
Prerequisites:	MPF103
This course is a pre-requisite for:	MPT202, MPT230
Vocational Learning Outcomes (VLO's): **Please refer to program web page for a complete listing of program outcomes where applicable.**	**4041 - AUTOMOTIVE REPAIR** #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. #6. Disassemble and assemble components to required specifications by applying workshop skills and knowledge of basic shop practices. #7. Use a variety of test equipment to assess basic electronic circuits, vehicle systems, and subsystems. #8. Apply basic knowledge of hydraulics and pneumatics to the testing and inspection of basic motive power systems and subsystems. #9. Communicate information effectively, credibly, and accurately by producing supporting documentation to appropriate standards. #10. Use information technology and computer skills to access data concerning repair

	procedures and manufacturer's updates. #11. Prepare logs, records, and documentation to appropriate standards. #12. Apply business practices and communication skills to improve customer service.
Essential Employability Skills (EES):	#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.
Course Evaluation:	Passing Grade: 50%, D
Other Course Evaluation & Assessment Requirements:	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. (Student will be given notice of test and assignment dates in advance) NOTE: All assignments will be in typed format. NO hand written assignments will be accepted. (Students will be given notice of test and assignment dates in advance) The following semester grades will be assigned to students: 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 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. W Student has withdrawn from the course without academic penalty.
Evaluation Process and Grading System:	**Evaluation Type** / **Evaluation Weight** Assighments / 10% Employabilty Skills / 10% Shop / 35%

Tests	45%

Books and Required Resources:

Automotive Technology: A Systems Approach by Erjavec
Publisher: Thomson Nelson Learning Canada Edition: 3rd Canadian

Heavy Duty Truck Systems by Bennet
Publisher: Thomson Nelson Learning Canada Edition: 6th

Course Outcomes and Learning Objectives:

Course Outcome 1.

Define the essential basic information and fundamentals of standard hydraulic and air brake systems.

Learning Objectives 1.

Potential Elements of the Performance
- Pascal`s Law, mechanical advantage
- Effect of heat co-efficient of friction
- Brake fluid composition
- Self -energization
- Weight transfer affecting brake designs for light and heavy-duty off road equipment brakes
- Laws of levers
- Pressure volume relationships
- Boyles and Charles law

Course Outcome 2.

Explain the basic function, composition and construction of drum and disc brake system assemblies as applied to hydraulic and air brakes.

Learning Objectives 2.

Potential Elements of the Performance:
- Master cylinder, drum, shoes, wheel cylinders, discs, pads, calipers, lines and hoses
- Slack adjusters
- Air brake chambers
- Control valves
- Lines and hoses
- SAHR
- Multi disc wet brakes
- Driveline brakes
- Parking brakes

Course Outcome 3.

Explain the basic principals of operation of drum and disc brake system assemblies as applied to hydraulic and air brakes.

Learning Objectives 3.

	Potential Elements of the Performance: • Master cylinder, drums and shoes • Wheel cylinders, discs, pads ,caliper • Control devices • Air supply system and subsystems • Air brake chambers • Slack adjusters • Parking brakes **Course Outcome 4.** Identify, inspect and service drum and disc brake system assemblies as applied to hydraulic and air brakes. **Learning Objectives 4.** Potential Elements of the Performance: • Clean, lubricate and adjust hydraulic drum brake assemblies • Clean, lubricate and adjust air drum and disc brake assemblies • Inspect and test disc brake assemblies • Service caliper slides and bushings • Perform steel brake line fabrication, ISO and double inverted • Bleed and flush hydraulic brake systems • Inspect and adjust parking brakes • Functional tests of air brake supply systems • Inspect Heavy Duty wet multi disc brake assemblies
Date:	Monday, December 18, 2017
	Please refer to the course outline addendum on the Learning Management System for further information.