

10/10/2024

DATE



REQUIRED COURSE



ELECTIVE COURSE

TEC

DIVISION



NEW COURSE



REVISION

Lake Land College

Course Information Form

| | | | | | | | | | | | |
|--------------------------------------|--|------------------|--|------------------------|---------------------|------|------------------------------|---------|----------|--------|-----|
| COURSE NUMBER: | AUT-053 | | TITLE: (30 Characters Max) | | Brake Systems | | | | | | |
| SEM CR HRS: | 3 | Lecture: | 2 | | Lab: | 2 | | | ECH: | 4 | |
| Course Level: | <input type="checkbox"/> Gen Ed / IAI <input type="checkbox"/> Baccalaureate / Non-IAI | | <input checked="" type="checkbox"/> Career/Technical <input type="checkbox"/> Dev Ed/ Not in Degree Audit | | Clinical Practicum: | 0 | Work-based Learning: | 0 | WBL ECH: | 0 | |
| COURSE PCS # | 12 - 47.0604 | | IAI Code | | N/A | | Contact Hours (Minutes/Week) | | | | |
| Repeatable (Y/N): | N | Pass/Fail (Y/N): | N | Variable Credit (Y/N): | N | Min: | Max: | 16 Wks. | 200 | 8 wks. | 400 |
| Prerequisites: | AUT-048 and AUT-051 | | | | | | | | | | |
| Corequisites: | None | | | | | | | | | | |
| Catalog Description: (40 Word Limit) | This course is a study of the hydraulic principles of drum, disc and ABS brake systems. Basic diagnosis and repair of the hydraulic system, power assist systems, drum and disc braking systems and ABS braking systems. | | | | | | | | | | |

| List the Major Course Segments (Units) | Contact Lecture Hours | Contact Lab Hours | Clinical Practicum | Work-based Learning |
|---|-----------------------|-------------------|--------------------|---------------------|
| Braking system components and performance standards | 2 | | | |
| Braking principles and friction materials | 2 | | | |
| Brake hydraulic systems | 1 | | | |
| Hydraulic valves and switches | 1 | | | |
| Brake fluid and lines | 1 | 3 | | |
| Brake bleeding methods and procedures | 2 | 3 | | |
| Wheel bearing service | 1 | | | |
| Drum brakes | 1 | | | |
| Drum brake diagnosis and service | 2 | 6 | | |
| Disc brakes | 1 | | | |
| Disc brake diagnosis and service | 2 | 6 | | |
| Parking brake operation, diagnosis and service | 2 | 3 | | |
| Machining brake drums and rotors | 2 | 6 | | |
| Power brake unit operation, diagnosis and service | 3 | 3 | | |
| ABS components and operation | 2 | | | |
| ABS diagnosis and service | 2 | 5 | | |
| Electronic stability control systems | 2 | 2 | | |
| Regenerative brake systems | 1 | | | |
| | 30 | 37 | 0 | 0 |

| EVALUATION | | | |
|--|---|--|---------------------------------|
| QUIZZES <input checked="" type="checkbox"/> | EXAMS <input checked="" type="checkbox"/> | ORAL PRES <input type="checkbox"/> | PAPERS <input type="checkbox"/> |
| LAB WORK <input checked="" type="checkbox"/> | PROJECTS <input type="checkbox"/> | COMP FINAL <input checked="" type="checkbox"/> | OTHER <input type="checkbox"/> |

| COURSE MATERIALS | |
|---------------------|----------------------------|
| TITLE: | Automotive Chassis Systems |
| AUTHOR: | James D. Halderman |
| PUBLISHER: | Pearson |
| VOLUME/EDITION/URL: | Eighth Edition |
| COPYRIGHT DATE: | 2021 |

| MAJOR COURSE SEGMENT | HOURS | LEARNING OUTCOMES |
|---|-------|---|
| | | <i>The student will be able to:</i> |
| Braking system components and performance standards | 2 | 1. Explain the fundamentals, design requirements, brake categories and the purpose of ABS brake systems. |
| Braking principles and friction materials | 2 | 1. Explain the energy and friction principles with results that apply to brakes. 2. Discover friction materials used in brakes. 3. Outline which materials are best for an application. |
| Brake hydraulic systems | 1 | 1. Explain Pascal's law about liquids. 2. Identify the purpose, operation, types and diagnosis of the master cylinder. |
| Hydraulic valves and switches | 1 | 1. Explain the operation, functions and troubleshooting procedures of the hydraulic valves, switches and sensors used on the hydraulic brake system. |

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|---|---|---|
| Brake fluid and lines | 4 | 1. Explain the purpose, function, specifications and replacement of the brake fluid, line and hoses used in the brake system |
| Brake bleeding methods and procedures | 5 | 1. Explain the need and procedures used to bleed the brake system. 2. Demonstrate how to do the bleeding procedure. |
| Wheel bearing service | 1 | 1. Explain the types, diagnosis and service of the wheel bearings. 2. Demonstrate bearing service procedures. |
| Drum brakes | 1 | 1. Recognize the components, advantages and disadvantages of drum brakes. 2. Explain the operation of non-servo, dual-servo and adjusters in brake systems. |
| Drum brake diagnosis and service | 8 | 1. Demonstrate the procedures recommended for drum brake diagnosis, removal, disassembly, inspection and replacement of components. |
| Disc brakes | 1 | 1. Recognize the components and operation of the disc brake system. 2. Explain the types of calipers, pads and rotors used. |
| Disc brake diagnosis and service | 8 | 1. Demonstrate the procedures recommended for disc brake diagnosis, removal, disassembly, inspection and replacement of components. |
| Parking brake operation, diagnosis and service | 5 | 1. Explain the standards and components used in parking brakes. 2. Demonstrate procedures in servicing the parking brake system. |
| Machining brake drums and rotors | 8 | 1. Explain the types, factors that cause damage and service procedures for drum and disc brakes. 2. Demonstrate how to measure and service drums and rotors. |
| Power brake unit operation, diagnosis and service | 6 | 1. Explain the need, operation, components and diagnosis of power brake system. |
| ABS components and operation | 2 | 1. Explain the purpose, operation and system configurations of the ABS systems. |
| ABS diagnosis and service | 7 | 1. Demonstrate the diagnosis procedure, retrieval of diagnostic codes, hydraulic ABS system bleeding and sensors servicing. |
| Electronic stability control systems | 4 | 1. Explain the purpose, operation and components for the electronic stability control system. 2. Demonstrate the procedure for diagnosing the ESC systems. |
| Regenerative brake systems | 1 | 1. Explain the principles, types, components and operation of the regenerative brake system. |

| Outcomes* | At the successful completion of this course, students will be able to: |
|-------------------------------------|--|
| Course Outcome | Distinguish a diagnostic strategy to repair ABS or ESC concerns with a vehicle. |
| Course Outcome | Assess the condition of brake system and need for servicing. |
| Course Outcome | Determine the procedure needed to complete disc brake service. |
| Primary Laker Learning Competency | Information & Technology Literacy: Students not only identify when information is necessary, but they also find, evaluate and use that information effectively with the appropriate technological tools. |
| Secondary Laker Learning Competency | Creative Thinking & Problem Solving: Students think creatively and solve problems by successfully combining knowledge in new ways. |

*Course and program outcomes will be used in the software for outcomes assessment and should include at least 1 primary and 1 secondary Laker Learning Competency. Limit to 3-5.