

AUTO 013A: AUTOMOTIVE BRAKING SYSTEMS

Originator

dredman

Co-Contributor(s)**Name(s)**

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Justification / Rationale

The Automotive Faculty are reviewing and/or updating this course to assure compliance with local, State, and Federal regulations; support consistency within the curriculum; practice relevance in regard to automotive industry and community; and to make improvements that will strengthen the learning environment this course creates thus benefiting the learners.

Effective Term

Fall 2022

Credit Status

Credit - Degree Applicable

Subject

AUTO - Automotive Technology

Course Number

013A

Full Course Title

Automotive Braking Systems

Short Title

AUTO BRAKE SYS

Discipline**Disciplines List**

Automotive Technology

ModalityFace-to-Face
Hybrid**Catalog Description**

This course provides theory and hands-on experience in automotive braking systems including: theory of operation, service, diagnosis and repair including both base braking and anti-lock braking systems and components. A \$20.00 test fee for the appropriate Automotive Service Excellent (ASE) Student Exam is required. A uniform is required for this course.

Schedule Description

This class provides lecture/discussion and hands-on experience understanding, servicing, troubleshooting, diagnosing and repairing automotive braking. A \$20.00 test fee for the appropriate Automotive Service Excellent (ASE) Student Exam is required. A uniform is required for this course.

Lecture Units

3

Lecture Semester Hours

54

Lab Units

1

Lab Semester Hours

54

In-class Hours

108

Out-of-class Hours

108

Total Course Units

4

Total Semester Hours

216

Required Text and Other Instructional Materials**Resource Type**

Book

Open Educational Resource

No

Author

Various

Title

ASE Automotive Suite (Text, shop manual, and workbook for all 8 ASE automotive categories)

Edition

7th

City

Tinley Park, Illinois

Publisher

Goodheart Wilcox

Year

2021

College Level

Yes

Flesch-Kincaid Level

11.4

ISBN #

978-1-64564-559-7

Resource Type

Book

Formatting Style

APA

Author

M. Ellison

Title

Automobiles Have Computers?

Edition

1

City

Dubuque, IA

Publisher

Kendal Hunt

Year

2022

College Level

Yes

Flesch-Kincaid Level

13

ISBN #

978-1-7924-9479-6

Class Size Maximum

24

Course Content

1. Orientation, SP2 safety & environmental concerns.
2. Auto repair industry terms and conventions.
3. Hand tools, special service tools and shop equipment.
4. Hydraulic theory and systems.
5. Braking system overview.
6. Principles of braking.
7. Disc and drum brake theory, including power assist: diagnosis, service and repair.
8. Antilock brake system theory.
9. Brake system service.
10. Brake system diagnosis, troubleshooting and repair.
11. Antilock brake system diagnosis, troubleshooting and repair.
12. Electrical/electronic brake systems.
13. Advanced driver assist systems (ADAS) related to braking.
14. Automotive industry web-based training modules.

Lab Content

1. Demonstrate proper shop safety and environmental practices.
2. Use of tool and equipment.
3. Preventative maintenance.
4. Proper procedures related to electrical/electronic brake systems.
5. Diagnose and repair disc and drum brake system concerns.
6. Diagnose and repair antilock brake system concerns.
7. Diagnosis and repair of power assist systems.
8. Perform brake system service.
9. Properly document repair orders.
10. Proficiency at researching service information.
11. Advanced driver assist systems (ADAS) related to braking.
12. Meet the Automotive Service Excellence (ASE) 2017 Master Automotive Service Technician (MAST) standards.

Course Objectives

	Objectives
Objective 1	Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
Objective 2	General: Brake System Diagnosis.

Objective 3	Hydraulic System Diagnosis and Repair.
Objective 4	Drum Brake Diagnosis and Repair.
Objective 5	Disc Brake Diagnosis and Repair.
Objective 6	Power-Assist Units Diagnosis and Repair.
Objective 7	Related Systems (i.e., Wheel Bearings, Parking Brakes, Electrical) Diagnosis and Repair.
Objective 8	Electronic Brake Control Systems: Anti-lock Brake (ABS), Traction Control (TCS), and Electronic Stability Control (ESC) Systems Diagnosis and Repair.
Objective 9	Tools and Equipment, shop and Personal Safety .
Objective 10	Preparing Vehicle for Customer.
Objective 11	Describe operation and system components used in braking related advanced driver assist systems.
Objective 12	Successfully complete SP2 safety training.

Student Learning Outcomes

Upon satisfactory completion of this course, students will be able to:	
Outcome 1	Demonstrate shop safety practices while working on automotive braking systems in a team setting.
Outcome 2	Practice proper inspection, diagnostic, repair, and maintenance skills on a brake system malfunction.
Outcome 3	Demonstrate proficiency in referencing service information and documenting repairs while exhibiting the ability to inspect and perform maintenance on base brake systems.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Demonstration, Repetition/Practice	Learners will perform assigned lab activities.
Technology-based instruction	Diagnostic test equipment, computer-based tools, and virtual reality scenarios.
Lecture	Each class is half lecture covering multiple aspects of course content.
Laboratory	Learners will participate in lab based activities to complete their National Automotive Technicians Education Foundation (NATEF) standards job sheets.
Discussion	Classroom and lab activities require critical thinking and diagnosis.
Observation	Learners will work in a team setting while performing lab activities.
Participation	Learners may be required to complete a research assignment.

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
College level or pre-collegiate essays	Learners will analyze course material and write a research paper related to the course.	Out of Class Only
Student participation/contribution	Learners will participate in role-play activities simulating customer/technician interactions.	Out of Class Only
Tests/Quizzes/Examinations	Used to evaluate learners' knowledge and understanding of the information presented. Examples of these are not limited to quizzes, exams, presentations, research, or projects.	In and Out of Class
Group activity participation/observation	Learners will work in a team setting while demonstrating proficiency in performing lab activities. Learners may participate in role play activities.	In Class Only
Presentations/student demonstration observations	Each learner will demonstrate their ability to correctly perform a given task not limited to laboratory assignments, research projects, interactive role-play and group activities.	In Class Only

Laboratory projects	Learners will demonstrate necessary skills required to complete lab-based activities to complete their ASE standards job sheets.	In Class Only
Written homework	Evaluation of homework, lab activity evaluations.	Out of Class Only

Assignments

Other In-class Assignments

1. Review homework from required text: multiple-choice questions, fill in the blank and essay questions to be graded each week.
2. Begin 3 SP2 safety tests.
3. Notes on lecture.
4. Participation in discussion related to topic of lecture.
5. Review and discuss vehicle diagnosis, troubleshooting and repair of personal, shop and other vehicles to be evaluated by the instructor during lab time.
6. Must develop teamwork skills through classroom interaction and discussion.

Other Out-of-class Assignments

1. Readings from required text: 1-3 chapters per week from both classroom and shop manuals.
2. Homework from required text: multiple-choice questions, fill in the blank and essay questions to be graded each week.
3. Completion of 3 SP2 safety tests.
4. Assigned readings and written summaries from selected instructor handouts.
5. Written summaries and analysis of assigned websites.
6. Must complete a course project consisting an essay describing, analyzing and summarizing a selected topic, including out of class research and fieldwork.
7. Vehicle diagnosis, troubleshooting and repair of personal, shop and other vehicles to be evaluated by the instructor during lab time.
8. Hands-on lab worksheets matching each course objective. These will be graded by the instructor throughout the semester during lab time.
9. Must develop teamwork skills through lab activities and assigned special projects.
11. Automotive industry web-based training modules.

Grade Methods

Letter Grade Only

Distance Education Checklist

Include the percentage of online and on-campus instruction you anticipate.

Online %

50

On-campus %

50

Lab Courses

How will the lab component of your course be differentiated from the lecture component of the course?

Lab component of the course will be completed in a laboratory environment on campus under the supervision of an appropriate facilitator.

From the COR list, what activities are specified as lab, and how will those be monitored by the instructor?

The facilitator will supervise all lab content, guiding the learner in productivity and understanding.

How will you assess the online delivery of lab activities?

Laboratory activities will not be delivered in the online setting, only in person.

Instructional Materials and Resources

If you use any other technologies in addition to the college LMS, what other technologies will you use and how are you ensuring student data security?

SP2 online safety training.

If used, explain how specific materials and resources outside the LMS will be used to enhance student learning.

SP2 - free account provided to all used to ensure the learners ability to distinguish safe working practices and conditions from unsafe practices and conditions.

Effective Student/Faculty Contact

Which of the following methods of regular, timely, and effective student/faculty contact will be used in this course?

Within Course Management System:

Chat room/instant messaging
Discussion forums with substantive instructor participation
Online quizzes and examinations
Private messages
Regular virtual office hours
Timely feedback and return of student work as specified in the syllabus
Video or audio feedback
Weekly announcements

External to Course Management System:

Direct e-mail
Synchronous audio/video

For hybrid courses:

Field trips
Orientation, study, and/or review sessions
Scheduled Face-to-Face group or individual meetings

Briefly discuss how the selected strategies above will be used to maintain Regular Effective Contact in the course.

Regular effective contact will be practiced through online lecture, discussion board postings, email communications, regular announcements, prompt grading and feedback of assignments, and virtual office hours. This contact between the facilitator and learner on a regular basis will enhance learner confidence and understanding and promote critical thinking and analyzation of subject matter.

If interacting with students outside the LMS, explain how additional interactions with students outside the LMS will enhance student learning.

Interaction between instructor and learner will help to enhance learning and understanding of subject material.

Other Information

Provide any other relevant information that will help the Curriculum Committee assess the viability of offering this course in an online or hybrid modality.

With the uncertainty of the teaching environment, enabling the lecture portion of this course to be delivered in an online setting, while keeping the hands on portion face-to-face, will ensure learners can access needed training to ensure knowledge and experience is achieved to gain employment in the automotive field.

MIS Course Data

CIP Code

47.0604 - Automobile/Automotive Mechanics Technology/Technician.

TOP Code

094800 - Automotive Technology

SAM Code

C - Clearly Occupational

Basic Skills Status

Not Basic Skills

Prior College Level

Not applicable

Cooperative Work Experience

Not a Coop Course

Course Classification Status

Credit Course

Approved Special Class

Not special class

Noncredit Category

Not Applicable, Credit Course

Funding Agency Category

Not Applicable

Program Status

Program Applicable

Transfer Status

Transferable to CSU only

General Education Status

Y = Not applicable

Support Course Status

N = Course is not a support course

Allow Audit

Yes

Repeatability

No

Materials Fee

No

Additional Fees?

Yes

Additional Fee Amount

\$20.00

Additional Fees Description

Automotive Service Excellent (ASE) Student Exam.

Approvals**Curriculum Committee Approval Date**

3/17/2022

Academic Senate Approval Date

3/24/2022

Board of Trustees Approval Date

4/22/2022

Chancellor's Office Approval Date

5/06/2022

Course Control Number

CCC000631392

Programs referencing this course

Automotive Air Conditioning Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=104>)
Automotive Braking Systems Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=109>)
Automotive General Service Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=110>)
Automotive Light and Medium Duty Diesel Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=111>)
Automotive Steering, Suspension, Alignment Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=112>)
Automotive Introductions Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined/?key=201>)
Automotive Technology AS Degree (<http://catalog.collegeofthedesert.eduundefined/?key=57>)