Raritan Valley Community College
Course Outline

AUTC 102 – Automotive Brake Systems

I. Basic Course Information

A. Course Number and Title: AUTC 102 – Automotive Brake Systems

B. New or Modified Course: Modified

C. Date of Proposal: Fall 2017

D. Effective Term: Fall 2018

E. Sponsoring Departments: *Science and Engineering Department*

F. Semester Credit Hours: 4

G. Weekly Contact Hours: 6 Lecture: 3
Laboratory: 3
Out of class student work per week: 7.5

H. Co-requisite: A grade of C or better in AUTC 101 – Automotive Introduction, Fundamentals, and Safety

I. Laboratory Fees: Yes

J. Name and Telephone Number or Email Address of Department Chair and Divisional Dean at time of approval:
Department Chair: Marianne Baricevic, Marianne.baricevic@raritanval.edu
Divisional Dean: Sarah Imbriglio, sarah.imbriglio@raritanval.edu

II. Catalog Description

Co-requisite: A grade of C or better in AUTC 101 – Automotive Introduction, Fundamentals, and Safety. This course provides an overview of the brake system. Training will cover the brake system fundamentals, principles, and complete brake servicing to the mechanical and hydraulic braking system. Inspection diagnosis, adjustment, and repair of drum, disc, hydraulics, and anti-lock brake systems will be performed.

In the lab, students will learn a hands-on strategy to perform basic maintenance of braking systems and learn how to use a variety of hand tools and diagnostic tools and processes. Students

will be required to wear clothing appropriate for auto shop safety at all classes. Safety glasses will also be required at all classes.

III. Statement of Course Need

A. Automotive technicians are vital to our mobile and transport-dependent community. Understanding the proper maintenance, service, and repair of brake system in automobiles and their maintenance are integral elements for the education of well-trained technicians in the field. Efficiency, performance and compliance with EPA regulations (State and Federal) are mandatory in this field as well as customer satisfaction. This course is intended to enhance the student's knowledge beyond understanding.

B. Lab assignments for the course will introduce students to the basic engine power plant of the vehicle and maintenance and repair of engine systems, while maintaining instruction that reinforces safety practices in a demonstrative environment.

C. Course transferability: The course transfers as one of the core fundamental courses for the Automotive Technology major and includes a laboratory component; for New Jersey schools go to the NJ Transfer website, www.njtransfer.org. For all other colleges and universities, go to their individual websites.

IV. Place of Course in College Curriculum

A. Free Elective

B. This course meets the program requirement for the Automotive Technology Certificate and the Associate of Applied Science in Automotive Technology.

C. Course transferability; for New Jersey schools go to the NJ Transfer website, www.njtransfer.org. For all other colleges and universities go to their individual sites.

V. Outline of Course Content

A. Safety and Brake System Principles
B. Brake System Fundamentals
    i. Kinetic Energy
    ii. Heat Transfer
    iii. Rotational Force
    iv. Levers and Mechanical Advantage
C. Brake Fluid and Hydraulics
    i. Hydraulic and Hydraulic System Components

ii. Hydraulic Brake and Power Booster

D. Wheel Bearing, Hub System Service
E. Drum Brake Systems
F. Disc Brake Systems
    i. Disc Brakes and Components
    ii. Disc Brake Procedures
G. Combination Systems
H. Service Brake Systems
I. Parking Brake Systems
J. Machining Drums and Rotors
K. Power Boosters, Vacuum and Hydraulic
L. ABS System Principles
M. ABS Components and Operation
N. ABS Diagnosis and Problem Solving

VI. General Educational and Course Learning Outcomes

A. General Educational Learning Outcomes

At the completion of the course, students will be able to:

1. identify appropriate techniques to troubleshoot, repair, maintain, and solve problems related to varied automotive brake systems (GE NJ 4)
2. apply quantitative reasoning to problems with the maintenance of automotive brake systems (GE NJ 2)
3. discuss issues involving automotive brake systems (GE NJ 1)

B. Course Learning Outcomes

At the completion of the course, students will be able to:

1. Identify maintenance issues arising in brake systems.
2. Discuss the theory and operations of brake systems, ABS systems, and components.
3. Analyze the structure and function of brakes used in automobiles.
4. Compare and contrast various brake system components in different body types.
5. Inspect, test, and replace brake components according to manufacturer's specifications.
6. Identify distinct structures of and maintain hydraulic brake systems including ABS systems.
7. Perform lab experiments and tasks to competent skill level as listed on the NATEF curriculum standards.

C. Assessment Instruments

1. lectures
2. demonstrations
3. laboratory work
4. instructional videos/DVDs
5. laboratory performance
6. examinations
7. NATEF task list

VII. Grade Determinants

A. lab performance
B. examinations
C. class participation
D. technical writing
E. interactive simulations

Primary formats, modes, and methods for teaching and learning that may be used in the course:

A. lecture/discussion
B. small-group work
C. group discussion
D. computer-assisted instruction
E. laboratory
F. simulation/role playing
G. demonstration
H. student collaboration

VIII. Text and Materials

A. Suggested Text: Automotive Technology: Principles, Diagnosis, and Service Plus MyAutomotiveLab with Pearson eText -- Access Card Package / Edition 5 by James D. Halderman (Author), Prentice Hall Publishing ISBN-10: 0134009088 / ISBN-13: 9780134009087

B. Students will be required to wear clothing appropriate for auto shop safety at all classes. Student are required to wear a standard industry uniform. Safety glasses will also be required at all classes.

C. The Automotive Program utilizes online curriculum and online industry service and repair information from the following sources:

I. AllData

II. Snap On Industries
III. Shop Key Pro.

D. Various Automotive Magazines

E. Students are provided the use of RVCC technology during the course

Please note: The course outline is intended only as a guide to course content and resources. Do not purchase textbooks based on this outline. The RVCC Bookstore is the sole resource for the most up-to-date information about textbooks.

IX. Resources

A. Reference books
B. AllData
C. Shop Key Pro
D. Snap On Industries
E. NAPA Pro-Link
F. Published Automotive Magazines
G. Lab/Shop Tools and Equipment
H. CDX Interactive Courseware
I. Safety equipment
J. Lubricants and various automotive fluids
K. Sample automotive system components
L. Instructional videos/DVDs
M. Auto mechanics shop facility at RVCC workforce building