



South Central College

## AST 1622 Advanced Brakes

### Course Outcome Summary

#### Course Information

<b>Description</b>	This course will cover anti-lock brake systems. Emphasis will be placed on system operation and controls. Diagnosis, repair, and maintenance of the various types of systems will also be included. (Prerequisite: Admission into the Automotive Service program and AST1112 or instructor approval)
<b>Total Credits</b>	2
<b>Total Hours</b>	48

#### Types of Instruction

Instruction Type	Credits/Hours
Lecture	1/16
Lab	1/32

#### Pre/Corequisites

Admission into the Automotive Service program

#### Institutional Core Competencies

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

#### Course Competencies

##### 1. Exhibit professionalism

###### Learning Objectives

Identify brake related health hazards  
Identify brake-related safety procedures  
Exhibit proper safety procedures

##### 2. Explain hydraulic system operation

###### Learning Objectives

Describe metering, proportioning, and combination valve operation  
Inspect brake lines and fittings for leaks, damage, or corrosion  
Inspect flexible brake hoses  
Depressurize high-pressure components of the electronic brake control system

**3. Check parking brake operation and adjust as needed**

**Learning Objectives**

Service parking brake cables and linkage  
Replace drum style parking brake shoes  
Adjust integrated caliper parking brake

**4. Describe anti-lock brake system operation**

**Learning Objectives**

Identify and inspect electronic brake control system components (ABS, TCS, ESC); determine needed action.  
Describe Traction Control System (TCS) operation  
Describe Electronic Stability Control (ESC) operation

**5. Observe anti-lock brake system warning light(s) for proper operation**

**Learning Objectives**

Inspect and test a brake warning light system  
Check the operation of the stop light system  
Perform a road test

**6. Diagnose poor stopping, wheel lock-up, abnormal pedal feel, unwanted application, and noise concerns associated with the electronic brake control system; determine necessary action**

**Learning Objectives**

Describe procedure for performing a road test to check brake system operation including an anti-lock brake system (ABS)  
Diagnose electronic brake control caused by vehicle modifications (tire size, curb height, final drive)  
Diagnose drum brake noise and performance problems  
Diagnose disc brake noise and performance problems  
Torque wheel lug nuts

**7. Diagnose electronic brake control system electronic control(s) and components by retrieving diagnostic trouble codes, and/or using recommended test equipment; determine necessary action**

**Learning Objectives**

Perform a basic operational test  
Perform a road test  
Remove and install electronic brake control system electrical / electronic and hydraulic components  
Test / diagnose / service electronic brake control system speed sensors (digital and analog) and toothed ring circuits with graphing multimeter (includes output signal, resistance, shorts to voltage / ground, and frequency data)  
Test / diagnose / service electronic brake control system speed sensors (digital and analog) and toothed ring circuits with digital oscilloscope (includes output signal, resistance, shorts to voltage / ground, and frequency data)  
Torque wheel lug nuts

**8. Bleed electronic brake control system hydraulics per manufacturer procedure**

**Learning Objectives**

Explain diagonally split brake system operation  
Select, handle, store, and install brake fluids to the proper level  
Check a master cylinder for internal and external leaks and proper operation  
Pressure bleed or flush a brake system  
Manually bleed or flush a brake system  
Fill anti-lock system master cylinder with recommended fluid per manufacturer procedures  
Torque wheel lug nuts  
Perform a road test

**SCC Accessibility Statement**

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and discuss accommodations. North Mankato: Room B-132, (507) 389-7222; Faribault: Room A-116, (507) 332-7222.

Additional information and forms can be found at: [www.southcentral.edu/disability](http://www.southcentral.edu/disability)

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