



**AUT 130  
AUTOMOTIVE BRAKE SYSTEMS  
COURSE SYLLABUS**

**\*\*Instructors will provide students with additional course-specific information, including attendance/makeup policies, assignment/test scheduling, and instructor contact information, as necessary and appropriate.\*\***

**Prerequisite(s):** AUT 122

**Corequisite(s):** AUT 122

**Quarter(s) Offered:** All

**Class Hours:** 3

**Lab Hours:** 3

**Credit Hours:** 4

**Course Description:** Introduces brake systems theory and its application to automotive systems. Topics include: hydraulic system diagnosis and repair; drum brake diagnosis and repair; disc brake diagnosis and repair; power assist units diagnosis and repair; miscellaneous ( wheel bearings, parking brakes, electrical, etc. ) diagnosis and repair.

**Student Learning Outcomes:** Upon successful completion of this course, the student should be able to:

*Hydraulic System Diagnosis and Repair*

- Measure and adjust pedal height.
- Check master cylinder for internal and external leaks and proper operation; determine necessary action.
- Remove, bench bleed, and reinstall master cylinder.
- Diagnose poor stopping, pulling or dragging concerns caused by problems in the hydraulic system; determine necessary action.
- Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear; tighten loose fittings and supports; determine necessary action.
- Fabricate and install brake lines (double flare and ISO types); replace hoses, fittings, and supports as needed.
- Select, handle, store, and install brake fluids to proper level.

- Inspect, test, and replace metering (hold-off), proportioning (balance), pressure differential, and combination valves.
- Inspect, test, replace, and adjust height (load) sensing proportioning valve.
- Inspect, test, and replace components of brake warning light system.
- Bleed (manual, pressure, vacuum or surge) brake system.
- Flush hydraulic system.

#### *Drum Brake Diagnosis and Repair*

- Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action.
- Remove, clean (using proper safety procedures), inspect, and measure brake drums; service or replace as needed.
- Mount brake drum on lathe; machine braking surface.
- Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble.
- Remove, inspect, and install wheel cylinders.
- Pre-adjust brake shoes and parking brake before installing brake drums or drum/hub assemblies and wheel bearings.
- Install wheel, torque lug nuts, and make final checks and adjustments.

#### *Disc Brake Diagnosis and Repair*

- Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action.
- Remove caliper assembly from mountings; clean and inspect for leaks and damage to caliper housing; determine necessary action.
- Clean and inspect caliper mounting and slides for wear and damage; determine necessary action.
- Remove, clean, and inspect pads and retaining hardware; determine necessary action.
- Disassemble and clean caliper assembly; inspect parts for wear, rust, scoring, and damage; replace seal, boot, and damaged or worn parts.
- Reassemble, lubricate, and reinstall caliper, pads, and related hardware; seat pads, and inspect for leaks.
- Reassemble, lubricate, and reinstall caliper, pads, and related hardware; seat pads, and inspect for leaks.
- Refinish rotor according to manufacturer's recommendations.
- Adjust calipers with integrated parking brake system.
- Install wheel, torque lug nuts, and make final checks and adjustments.
- Remove and replace rotor.

#### *Power Assist Units Diagnosis and Repair*

- Test pedal free travel with and without engine running; check power assist operation.
- Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster.
- Inspect the vacuum-type power booster unit for vacuum leaks; inspect the check valve for proper operation; determine necessary action.

- Inspect and test hydro-boost system and accumulator for leaks and proper operation; determine necessary action.

*Miscellaneous (Wheel Bearings, Parking Brakes, Electrical, Etc.) Diagnosis and Repair*

- Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine necessary action.
- Remove, clean, inspect, repack, and install wheel bearings and replace seals; install hub and adjust wheel bearings.
- Check parking brake cables and components for wear, rusting, binding, and corrosion; clean, lubricate, and replace as needed.
- Check parking brake operation; adjust as needed.
- Check operation of parking brake indicator light system.
- Check operation of brake stop light system; adjust and service as needed.
- Replace wheel bearing and race.

**Grading Scale:** The grading scale is detailed in the *Catalog and Student Handbook* and listed below for reference. All faculty members follow this scale when assigning grades to reflect a given student's performance in the classroom.

Grade	Numerical Equivalent	Grade Point
A/A*	90-100	4
B/B*	80-89	3
C/C*	70-79	2
D/D*	60-69	1
F/F*	0-59	0

Effective Summer Quarter 2006, Athens Technical College replaced the S/U grading system used for learning support classes with an A\*-F\* grading system. The registrar uses an asterisk (A\*, B\*, C\*, D\*, F\*, W\*, WF\*, WP\*) to designate learning support course grades on transcripts and grade reports because these grades are not components of the quarterly grade point average.

**Required Textbook(s), including ISBN:**

Title: *Modern Automotive Technology 7/e*  
 Author: Duffy (2009)  
 Publisher: Goodheart Wilcox.  
 ISBN: 978-1-59070-956-6

**Supplementary Material(s): None**

**Required Equipment/Tools/Resources:** Required Tool List will be provided by instructor

**Instructional Technologies Employed:** The primary method of instruction for this course will be lecture, reading assignments, demon-strations, video presentations, and practical applications that include live lab experience.

**Attendance:** Regular class attendance is important and expected. The college considers both tardiness and early departure from class as forms of absenteeism. Students absent from class for any reason are still responsible for all work missed. Instructors have the right to determine whether work missed can be made up and have the liberty to set reasonable expectations for attendance **based on frequency of class meetings and on the instructional delivery method, subject, type, and level of the class**. Class attendance policies will be clearly stated for students by their respective instructors on separate documents (course outlines/schedules) or appendices to the master syllabus.

**Grading Policy and Criteria:** Grade distribution will be determined as follows:

Unit Exam Average: 33%  
Lab Evaluation: 33%  
Final Exam: 33%

**Work Ethics:** To fulfill the responsibility to teach essential workplace ethics, the college evaluates program students on attendance, character, teamwork, appearance, attitude, productivity, organizational skills, communication, cooperation, and respect. Because students are preparing for employment, it is essential that they become accustomed to standards of behavior in the workplace. At the conclusion of the quarter, faculty members assign separate numerical work ethics grades which appear beside the course letter grades on both transcripts and grade reports. The work ethics grading scale is as follows: 3 (Exceeds Expectations), 2 (Meets Expectations), 1 (Needs Improvement), and 0 (Unacceptable).

**Academic Honesty:** Academic honesty is expected at all times. Any student found to have engaged in academic misconduct such as cheating, plagiarism, or collusion is subject to disciplinary sanctions as outlined in the Student Code of Conduct detailed in the *ATC Catalog and Student Handbook*. The term “plagiarism” includes, but is not limited to, the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgment. The term “collusion” includes, but is not limited to, the unauthorized collaboration with any other person in preparing work offered for academic credit. Students are advised that faculty routinely use **turnitin.com** both to prevent plagiarism and to assist in verifying when/if it has occurred.

**Course Withdrawal:** Students may withdraw from a course without academic penalty until the midpoint of the quarter (as stated in the Academic Calendar published in the *ATC Catalog and Student Handbook*). By withdrawing before the midpoint of the quarter, the student is automatically assigned a grade of W, which does not affect quarterly or cumulative grade point average. Grades of W will affect satisfactory academic progress for financial aid purposes. **Students who stop attending class(es) without formally withdrawing risk earning a final grade of F, which will appear on the academic transcript.** Refer to the *ATC Catalog and Student Handbook* for further details.

**Academic Support Center:** The Academic Support Centers of Athens Technical College (ATC) provide free tutoring for enrolled students. Both instructors and peer tutors provide

tutoring in almost all subjects offered by the college. Information about the Center is accessible via the ATC website at [www.athenstech.edu](http://www.athenstech.edu). To find out the specific services available on the Athens, Greene, and Walton Campuses, please call (706) 583-2839. To contact the Academic Support Center on the Elbert County Campus, please call (706) 213-2129.

**Americans with Disabilities Act:** Any student who believes he/she is eligible for accommodations in the classroom and/or during testing due to a documented disability is encouraged to contact the Director of Student Support Services at (706) 355-5081, or the Coordinator of Disability Services at (706) 355-5006, to apply for assistance. It is our goal at Athens Technical College to provide equal access to education for all students.

**Cell Phones and Electronic Devices:** Students are strictly prohibited from using cell phones and personal electronic devices within college-owned/operated facilities without the explicit permission of a faculty or staff member.

**Food/Drinks in Classroom:** Food and beverages (other than water) are not allowed in classrooms/labs.

**Warranty of Graduates:** The Department of Technical and Adult Education warrants every graduate of technical programs in which students may earn technical certificates of credit, diplomas, or associate degrees. The warranty guarantees that graduates demonstrate the knowledge and skills and can perform each competency as identified in the industry-validated standards established for every program of study. If one of our graduates educated under a standard program or his/her employer finds that the graduate is deficient in one or more competencies as defined in the course/program standards, Athens Technical College will retrain the employee at no instructional cost to the employee or the employer. This guarantee is in effect for two years after graduation.

**TEACH Act:** According to the TEACH Act of 2002, Athens Technical College is obligated to advise you that instructional material included in this course may be subject to copyright protection. As such, you must not share, duplicate, transmit, or store the material of this course beyond the purpose and time frame explicitly stated in the syllabus of your course. If you are not certain whether a particular piece of material is covered by copyright protection, you should contact your instructor and obtain his/her written clarification. Failing to observe copyright protection is a violation of law.