Basic Course Information

Semester:	**Fall 2018**	Instructor Name:	**Ricardo Pradis**
Course Title & #:	**Automotive Brakes AUT-125**	Email:	**ricardo.pradis@imperial.edu**
CRN #:	**10791**	Webpage (optional):	
Classroom:	**1100**	Office #:	**1100**
Class Dates:	**13 Aug. – 8 Dec.**	Office Hours:	**MTWR 7:00 – 8:00am**
Class Days:	**Monday & Wednesday**	Office Phone #:	**760-355-6403**
Class Times:	**6:00 – 9:10 pm 6:00 – 9:10 pm**	Emergency Contact:	**760-355-6403**
Units:	4		

Course Description

This course covers the principles and instruction in disassembly, inspection, installation, and adjustments of the modern brake system. Laboratory activities stress brake system diagnosis, repair, machining, and overhaul procedures and proper use of tools and equipment utilized in the industry. Upon successful completion of this course, students are prepared to take the Automotive Service Excellence (ASE) certification examination in brakes. (CSU)

Course Prerequisite(s) and/or Corequisite(s)

None

Student Learning Outcomes

1. Identify and interpret brake system concern; determine necessary action.

2. Diagnose pressure concerns in the brake system using hydraulic principles. (Pascal's Law).

3. Diagnose poor stopping, noise, vibration, pulling, graving, dragging or pedal pulsation concerns; determine necessary action.

4. Identify and inspect electronic brake control systems components; determine necessary action.

Course Objectives

1. Comply with all safety shop procedures associated with the handling of all hazardous materials in accordance with the regulations.
2. Correctly identify the major components of the automotive braking system.
3. Be familiar with different types of parking, combination, and anti lock brake (ABS) systems.
4. Be familiar with different types of brake fluids and master, wheel, and caliper brake cylinders.
5. Understand the operation and service of different types of power-booster units.
6. Measure and adjust brake pedal according to manufacture's specifications. Check brake system for internal and external leaks and proper operation. Inspect brake lines and fitting for brake fluid leaks or damage, and replace or repair (double flare) brake lines. Diagnose poor brake stopping, pulling or noise problems. Inspect, test, adjust and replace metering brake valves, brake warning light system. Flush and bleed (Manual, Pressure or vacuum) Hydraulic brake system.
7. Diagnose brake problem. Remove inspect, and measure brake drum for excessive wear, cracks or other damage. Mount brake drum on lathe machine using correct setting. Complete brake job overhaul. Remove and service wheel cylinders. Adjust brake lining and parking brake before installing brake drums. Torque all lug nuts to factory specification.
8. Diagnose poor stopping, noise pulling or other brake problem. Remove disc calipers, assemble and inspect for wear, leaks and damage. Reassemble, lubricate and re-install caliper and related hardware. Clean, inspect and measure rotor with a dial indicator and compare measurements with specifications. Mount disc brake in lathe machine and finish rotor according to specifications. Fill master cylinder with recommended fluid and seat pads, inspect caliper for leaks.
9. Test brake pedal supply with vacuum gage for power booster operation. Inspect all vacuum hoses for vacuum leaks, check valve for proper operation.
10. Diagnose wheel bearing problem such as noises, wheel shimmy and vibration problem. Remove, clean, inspect, repack and reinstall race and wheel bearing and replace bearing seal. Adjust to wheel bearing according to specifications.
11. Check parking brake cables and components for wear or damage. Check parking brake operation with transmission in gear, check operation of parking brake indicator and light system, operation of brake stop light system.
12. Inspect, test and services anti brake system. Diagnose poor stooping, wheel lockup, noise problems and other related brake problems. Diagnose anti-lock brake system and electronic control (s) and components. Depressurized high pressure components of the anti-lock brake system and use recommended safety procedures from manufacturers. Bleed the anti-lock brake system's front and clear hydraulic circuits following manufacture's procedures. Perform a fluid pressure (hydraulic boost) diagnosis on the high pressure antilock brake system (ABS). Remove and install anti-lock brake system electrical/electronic components. Diagnose anti-lock brake system braking problem cause by vehicle modification.

13. Be familiar with Automotive Services Excellence (ASE) examination requirements, and prepare to successfully pass exam.

Textbooks & Other Resources or Links

Equipment and Supplies:
1. Textbook: Fundamentals of Automotive Technology (CDX Learning Systems) ISBN:978-1-284-10995-5
2. Pen and pencils.
3. Standard writing paper.
4. Personal Protective Equipment:
• Safety glasses,
• Work footwear,
• Proper shirt and pants

Course Requirements and Instructional Methods

Methods of instructions may include, but are not limited to, the following: lectures, textbook worksheets, demonstrations. hands-on worksheets, internet readings, large and small group discussions, and audiovisual aids.

Out-of-class

Library computer software assignment. Read, review and answer the Level I, Level II, and Level III ASE Questions. After completion students will print out a report to find out the level were he/she needs support.

Reading and Writing

Read, review and answer Automotive Service Excellence(ASE) questions from ASE A5 class booklet motor age. When finished with assignment, the instructor will review each statement with live brake components. The assignment consists of: 1. General brake systems diagnosis-10 questions. 2. Hydraulic system diagnosis and repair-16 questions. 3. Drum brake diagnosis/repair- 6 questions. 4. Disc brake diagnosis/repair-13 questions. 5. Power assist units diagnosis/repair-4 questions. 6. Miscellaneous diagnosis/repair-7 questions. 7. Anti-Lock brake system Diagnosis and repair-9 questions.

Course Grading Based on Course Objectives

Grading Criteria:

1. Grading system:
•A=90%-100% of points= Excellent
•B=80%-89% of points= Good
•C*=70%-79% of points= Satisfactory
•D= 60%-69% of points= Pass, less than satisfactory
•F= Less than 60% of points= Failing
2. Very important:

•Mid-Term (60 points) will be given on October 3. It will be a multiple choice test Bring your Scantron, and pencil.
•Final-Exam (60 points) will be given on December 5. It will be a multiple choice test Bring your Scantron and pencil.
•There are no make-up exams unless you have a very good reason and make arrangements with the instructor before the exam.
•Final grades can be raised or lowered based on your preparation and participation in class. It benefits you to be engage and participative.

Grades:

	Points
Book worksheets, quizzes.	140
Lab activity, hands-on worksheets.	240
Mid-term	60
Final-exam	60
Total points	500

Course Grade:
The course grade is based on total points accumulated during the semester. There is a total of 500 points available. Grades are determined by dividing the total points you earn by the total points available to get your percentage. (Total points may vary if I change the assignments in a particular week). **Grading of Hands-on Assignments:**
The most common problem students experience is not being detailed enough in their answers and not spending the right amount of time in the repair procedures. Always be as specific as you can and use examples from your readings. Make sure to answer all parts of the questions. Points will be deducted for inadequate responses. Feedback will be given after each assignment and, hopefully, you will improve as you proceed with the course. The following grading rubric is used when grading assignments.

	Grading Rubric for Hands-on Assignment	Points
A	Focused and clearly organized. Contains critical thinking and content analysis. Convincing evidence is provided to support conclusions. Ideas are clearly communicated. Clearly meets or exceeds assignments requirements.	18-20
B	Generally focused and contain some development of ideas, may be simplistic or repetitive. Evidence is provided which supports conclusions. Meet assignments requirements.	16-17
C	May be somewhat unfocused, underdeveloped, or rumbling. But does have some coherence. Some evidence is provided which support conclusions. Meets minimum assignment requirements.	14-15
D	Unfocused, underdeveloped. Minimal evidence is used to support conclusion. Does not respond appropriately to the assignment.	12-13

F	Minimal effort by the student. Unfocused, underdeveloped. Evidence is not used to support conclusion. Block overall understanding. Does not meet assignment requirements.	0-11

Attendance

- A student who fails to attend the first meeting of a class or does not complete the first mandatory activity of an online class will be dropped by the instructor as of the first official meeting of that class. Should readmission be desired, the student's status will be the same as that of any other student who desires to add a class. It is the student's responsibility to drop or officially withdraw from the class. See General Catalog for details.
- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absences exceed the number of hours the class is scheduled to meet per week may be dropped. For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and may be dropped.
- Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.

Classroom Etiquette

- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class, unless otherwise directed by the instructor.
- Food and Drink are prohibited in all classrooms. Water bottles with lids/caps are the only exception. Additional restrictions will apply in labs. Please comply as directed by the instructor.
- Disruptive Students: Students who disrupt or interfere with a class may be sent out of the room and told to meet with the Campus Disciplinary Officer before returning to continue with coursework. Disciplinary procedures will be followed as outlined in the General Catalog.
- Children in the classroom: Due to college rules and state laws, no one who is not enrolled in the class may attend, including children.

Shop/ Lab Area

- Safety test must be passed to work in the shop and complete required lab exercise.
- Safety glasses are required to be worn at all times while in the shop area, safety glasses are the student responsibility (students not wearing safety glasses will be ask to leave the class for that day no exceptions).
- Clean up your area and any other lose debris or trash.
- Wear all required safety protection and comply with posted signs.
- No shorts or open toe foot wear, always be prepared to go into the lab area.
- Comply with tool check out policy and return tools clean.
- Do not perform any work on any vehicle outside the assigned task without permission from your instructor.
- Long hair must be kept in a ponytail or tucked away for safety.

Faculty and Staff:

All students are required to take direction from any faculty, any issues with direction should be brought up to your instructor, however all staff has the right to direct any student at any time. Please respect the staff's decisions.

Safety Requirements:

For every task perform in Automotive Brakes course the following safety requirements must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

Parking:

No student parking by the building, the only exception is on lab time if your vehicle is a project (instructor approved). Speed limit must be kept at or under 5MPH.

Parking permit is required at all times.

Projects:

All projects are to be taken with the student's unless otherwise approve by the instructor.

All approve projects must be removed from campus prior to finals.

All projects must have a written work order (R/O).

Shop Maintenance:

All work will cease 20 minutes prior to end of class.

All work areas must be cleaned.

Tools must be cleaned and returned to the tool room.

Any broken or missing tools must be reported immediately. Tools are student's responsibility.

Online Netiquette

- What is netiquette? Netiquette is internet manners, online etiquette, and digital etiquette all rolled into one word. Basically, netiquette is a set of rules for behaving properly online.
- Students are to comply with the following rules of netiquette: (1) identify yourself, (2) include a subject line, (3) avoid sarcasm, (4) respect others' opinions and privacy, (5) acknowledge and return messages promptly, (6) copy with caution, (7) do not spam or junk mail, (8) be concise, (9) use appropriate language, (10) use appropriate emoticons (emotional icons) to help convey meaning, and (11) use appropriate intensifiers to help convey meaning [do not use ALL CAPS or multiple exclamation marks (!!!!)].

Academic Honesty

Academic honesty in the advancement of knowledge requires that all students and instructors respect the integrity of one another's work and recognize the important of acknowledging and safeguarding intellectual property.

There are many different forms of academic dishonesty. The following kinds of honesty violations and their definitions are not meant to be exhaustive. Rather, they are intended to serve as examples of unacceptable academic conduct.

- Plagiarism is taking and presenting as one's own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and preparing written materials. If you do not understand how to "cite a source" correctly, you must ask for help.

- Cheating is defined as fraud, deceit, or dishonesty in an academic assignment, or using or attempting to use materials, or assisting others in using materials that are prohibited or inappropriate in the context of the academic assignment in question.

Anyone caught cheating or plagiarizing will receive a zero (0) on the exam or assignment, and the instructor may report the incident to the Campus Disciplinary Officer, who may place related documentation in a file. Repeated acts of cheating may result in an F in the course and/or disciplinary action. Please refer to the General Catalog for more information on academic dishonesty or other misconduct. Acts of cheating include, but are not limited to, the following: (a) plagiarism; (b) copying or attempting to copy from others during an examination or on an assignment; (c) communicating test information with another person during an examination; (d) allowing others to do an assignment or portion of an assignment; (e) using a commercial term paper service.

Additional Student Services

Imperial Valley College offers various services in support of student success. The following are some of the services available for students. Please speak to your instructor about additional services which may be available.

- CANVAS LMS. Canvas is Imperial Valley College's main Learning Management System. To log onto Canvas, use this link: Canvas Student Login. The Canvas Student Guides Site provides a variety of support available to students 24 hours per day. Additionally, a 24/7 Canvas Support Hotline is available for students to use: 877-893-9853.
- Learning Services. There are several learning labs on campus to assist students through the use of computers and tutors. Please consult your Campus Map for the Math Lab; Reading, Writing & Language Labs; and the Study Skills Center.
- Library Services. There is more to our library than just books. You have access to tutors in the Study Skills Center, study rooms for small groups, and online access to a wealth of resources.
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Disabled Student Programs and Services (DSPS)

Any student with a documented disability who may need educational accommodations should notify the instructor or the Disabled Student Programs and Services (DSP&S) office as soon as possible. The DSP&S office is located in Building 2100, telephone 760-355-6313. Please contact them if you feel you need to be evaluated for educational accommodations.

Student Counseling and Health Services

Students have counseling and health services available, provided by the pre-paid Student Health Fee.

- **Student Health Center**. A Student Health Nurse is available on campus. In addition, Pioneers Memorial Healthcare District provide basic health services for students, such as first aid and care for minor illnesses. Contact the IVC Student Health Center at 760-355-6128 in Room 1536 for more information.
- **Mental Health Counseling Services**. Short-term individual, couples, family and group counseling services are available for currently enrolled students. Services are provided in a confidential, supportive, and culturally sensitive environment. Please contact the IVC Mental Health Counseling Services at 760-355-6310 or in the building 1536 for appointments or more information..

Veteran's Center

The mission of the IVC Military and Veteran Success Center is to provide a holistic approach to serving military/veteran students on three key areas: 1) Academics, 2) Health and Wellness, and 3) Camaraderie; to serve as a central hub that connects military/veteran students, as well as their families, to campus and community resources. Their goal is to ensure a seamless transition from military to civilian life. The Center is located in Building 600 (Office 624), telephone 760-355-6141.

Extended Opportunity Program and Services (EOPS)

The Extended Opportunity Program and Services (EOPS) offers services such as priority registration, personal/academic counseling, tutoring, book vouchers, and community referrals to qualifying low-income students. EOPS is composed of a group of professionals ready to assist you with the resolution of both academic and personal issues. Our staff is set up to understand the problems of our culturally diverse population and strives to meet student needs that are as diverse as our student population.

Also under the umbrella of EOPS our CARE (Cooperative Agency Resources for Education) Program for single parents is specifically designed to provide support services and assist with the resolution of issues that are particular to this population. Students that are single parents receiving TANF/Cash Aid assistance may qualify for our CARE program, for additional information on CARE please contact Lourdes Mercado, 760-355- 6448, lourdes.mercado@imperial.edu.

EOPS provides additional support and services that may identify with one of the following experiences:

- Current and former foster youth students that were in the foster care system at any point in their lives
- Students experiencing homelessness
- Formerly incarcerated students

To apply for EOPS and for additional information on EOPS services, please contact Alexis Ayala, 760-355-5713, alexis.ayala@imperial.edu.

Student Equity Program

- The Student Equity Program strives to improve Imperial Valley College's success outcomes, particularly for students who have been historically underrepresented and underserved. The college identifies strategies to monitor and address equity issues, making efforts to mitigate any disproportionate impact on student success and achievement. Our institutional data provides insight surrounding student populations who historically, are not fully represented. Student Equity addresses disparities and/or disproportionate impact in student success across disaggregated student equity groups including gender, ethnicity, disability status, financial need, Veterans, foster youth, homelessness, and formerly incarcerated students. The Student Equity

Program provides direct supportive services to empower students experiencing insecurities related to food, housing, transportation, textbooks, and shower access. We recognize that students who struggle meeting their basic needs are also at an academic and economic disadvantage, creating barriers to academic success and wellness. We strive to remove barriers that affect IVC students' access to education, degree and certificate completion, successful completion of developmental math and English courses, and the ability to transfer to a university. Contact: 760.355.5736 or 760.355.5733 Building 100.

- The Student Equity Program also houses IVC's Homeless Liaison, who provides direct services, campus, and community referrals to students experiencing homelessness as defined by the McKinney-Vento Act. Contact: 760.355.5736 Building 100.

Student Rights and Responsibilities

Students have the right to experience a positive learning environment and to due process of law. For more information regarding student rights and responsibilities, please refer to the IVC General Catalog.

Information Literacy

Imperial Valley College is dedicated to helping students skillfully discover, evaluate, and use information from all sources. The IVC Library Department provides numerous Information Literacy Tutorials to assist students in this endeavor.

Anticipated Class Schedule/Calendar

WEEK 1:
Class orientation. Class introduction. Safety orientation, Class activities, using textbook, homework, safety test. For every chapter in the course there will be a quiz and review questions must be turn in for credit.
For every task in the Automotive Brakes class the following safety requirements must be strictly enforce:
Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposals of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

WEEK 2:

- Chapter 2: Introduction to Automotive Technology
- Lab. Activity: Identify body types, identify drivetrain components, identify chassis types.

WEEK 3:

- Chapter 43: Principles of Braking
- Lab. Activity: Check operation of regenerative braking

WEEK 4 & 5:

- Chapter 44: Hydraulics and Power Brakes Theory
- Lab. Activity: Component identification, check master cylinders, check proportioning valves,operation of brake system, check brake booster.

WEEK 6 & 7:

- Chapter 45: Servicing Brake Systems

- Lab. Activity: Bleed and or flush brake systems, replace brake components, inspect brake lines, parking brake operation, check brake pedal.

WEEK 7 & 8:

- Chapter 46: Disc Brake System.
- Lab. Activity: Performing road test, diagnose poor stopping problems, check wear indicators, replace brake pads, inspect rotors, refinish rotors.

WEEK 9:

- **MID-TERM**

WEEK 10 & 11:

- Chapter 47: Drum Brake System.
- Lab. Activity: Diagnose poor stopping problems, replace brake shoes, inspect wheel cylinders.

WEEK 12 & 13:

- Chapter 48: Wheel bearings.
- Lab. Activity: Diagnose wheel bearing noises, remove and replace bearings front and rear, clean and repack bearings.

WEEK 13 & 14:

- Chapter 49: Electronic Brake Control System.
- Lab Activity: Bleed electronic brake system, diagnose electronic brakes, used recommended test equipment.

WEEK 15:

- Chapter 64: Onboard diagnostic System
- Lab Activity: Interpret DTC's, scan tool data, monitor's verification, sensor, actuator operation, and test engine computer control, transmission computer control, suspension, anti-lock brake systems.

WEEK 16:

- **FINAL-EXAM**

*****Tentative, subject to change without prior notice*****