# BUTTE COLLEGE
## COURSE OUTLINE

I. **CATALOG DESCRIPTION**

**AUT 21 - Automotive Brakes/Suspension and Steering Systems Lab** **3 Unit(s)**

**Prerequisite(s):** AUT 41 (or concurrent enrollment)
**Co-requisite(s):** AUT 20
**Recommended Prep:** AUT 1

**Transfer Status:** CSU
150 hours Lab

In this course students will develop and demonstrate the hands-on skills needed to verify, diagnose and repair vehicle systems, sub systems, and components. Topics include: brake systems including both drum and disc brake systems, Anti-lock Brake Systems (ABS), steering and suspension systems, and electronic steering and suspension systems.

II. **OBJECTIVES**

Upon successful completion of this course, the student will be able to:

A. Diagnose and repair vehicle systems and components of disc brake systems.
B. Diagnose and repair vehicle systems and components of drum brake systems.
C. Diagnose and repair vehicle systems and components of anti-lock brake systems.
D. Diagnose and repair vehicle systems and components of suspension systems.
E. Diagnose and repair vehicle systems and components of steering systems.
F. Diagnose and repair vehicle systems and components of electronic steering/suspension systems.

III. **COURSE CONTENT**

A. **Unit Titles/Suggested Time Schedule**

Lab

| Topics | Hours |
|---|---|
| 1. Brake rotors, drums and linings. | 15.00 |
| 2. Diagnose and repair hydraulic system components. | 15.00 |
| 3. Drum, disc and parking brake type brake systems. | 15.00 |
| 4. Electronic brake systems, including ABS, stability and traction control. | 15.00 |
| 5. Suspension systems. | 15.00 |
| 6. Wheel servicing: safe removal and reinstallation of tires, alloy wheels, steel wheels and wheel bearings. | 15.00 |
| 7. Shocks and struts | 15.00 |
| 8. Short arm/long arm and strut type suspensions. | 15.00 |
| 9. Alignment readings using an alignment machine: adjustment of alignment angle discrepancies. | 15.00 |
| 10. Rack and pinion, re-circulating ball and electronic assist steering systems. | 15.00 |
| Total Hours | 150.00 |

IV. **METHODS OF INSTRUCTION**

A. Instructor Demonstrations
B. Collaborative Group Work
C. Discussion
D. Problem-Solving Sessions
E. Laboratory Experiments

V. **METHODS OF EVALUATION**

A. Papers
B. Demonstration
C. Lab Projects
D. Practical Evaluations

VI. **EXAMPLES OF ASSIGNMENTS**

A. Reading Assignments
    1. Read industry recognized technical information related to hydraulic systems and rebuild a faulty brake caliper.
    2. Read lab assignment instructions pertaining to alignment procedures then perform a four way alignment on a vehicle.

B. Writing Assignments
    1. Measure drum diameter on 6 drums and record results on a repair order with comparisons to specification. Create a written diagnosis on results for discussion.
    2. Conclude an ABS problem diagnosis and communicate cause and cure on a legal repair order for customer review.

C. Out-of-Class Assignments
    1. Not applicable

VII. **RECOMMENDED MATERIALS OF INSTRUCTION**

Textbooks:

A. Schnubel, M. Automotive Steering and Suspension Systems. 6th Edition. Cengage, 2015.
B. Pickerill, K. Automotive Brake Systems. 6th Edition. Cengage, 2015.

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