

BUTTE COLLEGE

COURSE OUTLINE

I. CATALOG DESCRIPTION

AUT 7 - Automotive Electrical Systems Lab

2 Unit(s)

Prerequisite(s): AUT 41 (or concurrent enrollment)

Co-requisite(s): AUT 6

Recommended Prep: AUT 1

Transfer Status: CSU

105 hours Lab

In this course students will develop and demonstrate the hands-on skills needed to repair automotive electrical/electronics systems. Topics include verification, diagnosis and repair of vehicle charging and starting systems, lighting systems, and electrical accessories, including hybrid vehicles.

II. OBJECTIVES

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

- A. Diagnose and repair to industry standards, vehicle systems related to batteries.
- B. Diagnose and repair vehicle systems area of starting systems.
- C. Diagnose and repair vehicle charging systems.
- D. Diagnose and repair vehicle lighting and signaling systems.
- E. Diagnose and repair vehicle multiplex communication networks.
- F. Diagnose and repair vehicle electrical accessories.
- G. Diagnose and repair passive restraint and supplemental restraint systems.

III. COURSE CONTENT

A. Unit Titles/Suggested Time Schedule

Lab	
<u>Topics</u>	<u>Hours</u>
1. Testing and service of conventional, maintenance free, hybrid, and recombination automotive batteries.	15.00
2. Diagnosis of starter motor condition through use of industry recognised methods and tools.	15.00
3. Performing charging system output, voltage drop and regulator tests.	15.00
4. Diagnosis and repair of lighting circuit malfunctions.	15.00
5. Diagnosis of Controller Area Network (CAN) bus system.	15.00
6. Identification of the causes of malfunctioning accessory systems related to horn, wipers and door windows.	15.00
7. Replacing an air bag and clock spring according to service information standards.	15.00
Total Hours	105.00

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. Demonstration
- B. Lab Projects
- C. Final Examination
- D. Performance Examinations
- E. Practical Evaluations

VI. EXAMPLES OF ASSIGNMENTS

- A. Reading Assignments
 - 1. Read safety precautions for air bag removal then demonstrate the procedure to remove an air bag.
 - 2. Read lab assigned instructions on safe battery handling. Be prepared to replace an automobile battery in class.
- B. Writing Assignments
 - 1. Measure voltage drops in a charging or starting system. Complete a written report on the findings and any recommendations.
 - 2. Conclude an air bag system diagnosis. Communicate the findings for customer review on a repair order.
- C. Out-of-Class Assignments
 - 1. Not applicable

VII. RECOMMENDED MATERIALS OF INSTRUCTION

Textbooks:

- A. Hollembeak, B. Automotive Electricity & Electronics. 6th Edition. Cengage, 2015.

Created/Revised by: Doug Conrad

Date: 11/02/2015