Laboratory Contact Hours: 48-54; Homework Hours: 0; Total Student Learning Hours: 48-54

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

AUTOMOTIVE TECHNOLOGY 162L – ELECTRONICS DIAGNOSIS AND REPAIR LABORATORY

3 hours laboratory, 1 unit

Catalog Description
This laboratory course describes and demonstrates proper diagnosis and repair of electronics systems of modern vehicles in the department laboratory, or by using distance education technologies such as augmented reality or virtual reality. The course also includes diagnosis of automotive computer modules, inputs and outs. This course is the lab for students taking AUTO 162 Electronics Diagnosis and Repair lecture, and or for students who are taking work experience and who need additional instruction and practice completing required NATEF competencies and tasks.

Prerequisite
None

Course Content
1) Safety policies and procedures
2) Laboratory exercises using distance education technologies
3) Laboratory practice using virtual reality or mobile technologies
4) Assistance of repair techniques using web conferencing and remote access computer sharing
5) Diagnosis of variable reluctance, Hall-effect, thermistors, potentiometer, pressure, and related sensors.
6) Accessing and programming automotive module software
7) Electronic network function diagnosis
8) Test inputs and output by use of scan tool
9) Graph electronic sensor waveforms
10) Electronic pinpoint tests
11) Lab-scope and voltmeter diagnosis of electronic systems

1) Course Objectives
2) Students will be able to:
3) Demonstrate ability to test computer control circuits of an output using the workshop manual and test equipment
4) Demonstrate ability to test computer circuits of an input using the workshop manual and test equipment
5) Demonstrate the ability to test variable reluctance and hall effect sensors
6) Demonstrate the ability to test potentiometers and thermistor sensors
7) Activate electronic components using a scan tool
8) Capture and manipulate parameter data using a diagnostic scan tool
9) Capture electronic waveforms of electronic components and networks
10) Perform programming initialization and installation of module software
11) Demonstrate special electronic system tests
12) Diagnose and repair automotive electronic system concerns.

Method of Evaluation
A grading system will be established. Grades determined by summative test proficiency in the subject matter using multiple measurements, one of which is a demonstration of the components related to the cause of failure using the diagnostic processes and skills demonstrations of corrections.

1) Skills-based summative assessment that measures students' ability to complete the required NATEF tasks related foundational knowledge of diagnosis, replacement, repair, and testing of automotive electronic systems.
2) Practical exercises that measure students' progress toward mastering tasks related to identification, description, communication, memorization of components for testing of electronic systems.
3) A Student portfolio is required to showcase student comprehension.
4) Web based training modules.
5) Performance projects used to evaluate student ability to accurately perform repair procedures using web conferencing and simulations.

Special Materials Required of Student
1) Approved safety glasses.
2) High-speed internet connection and access to large screen computer, laptop, or tablet.
3) Students will have access to testing tools and equipment while on campus and by simulations.
4) Uniform dress code is required.

Minimum Instructional Facilities
1) Auto tech lab (20 service bays)
2) Various training vehicles
3) Smart classroom
4) Diagnostic tools and equipment

Method of Instruction
1) Demonstration
2) Individual assistance
3) Feedback of repair processes regardless of successful or unsuccessful

Out-of-Class Assignments
1) Reading assignments
2) Writing assignments
3) Web-based training
4) Portfolio of artifacts learned during class

Texts and References
1) Required (representative examples):
   a. Student workbooks – will be provided electronically.
   b. Required:-CDX Master Automotive Technician Series, 2020, **ISBN:** 9781284170917
   c. Web Based Training Modules will be provided electronically.
   d. Workshop Manuals will be provided electronically.
2) Supplemental: None

Student Learning Outcomes
Upon successful completion of this course, students will be able to:
1) Accurately describe various electronic system conditions.
2) Repair electronic system problems by performing necessary actions.
3) Communicate effectively and professionally in a diverse setting that includes prospective colleagues, clients, and supervisors.
4) Comply with environmental health and safety regulations at the state and federal levels.