Laboratory Contact Hours: 24-27; Homework Hours: 0; Total Student Learning Hours: 24-27

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

AUTOMOTIVE TECHNOLOGY 161T – ELECTRICAL DIAGNOSIS AND REPAIR ASSESSMENT TEST OUT

1.5 hours laboratory, .5 unit

Catalog Description
This assessment course includes hands-on summative and criterion tests for students to prove knowledge skills and abilities to perform diagnosis and repair of electrical systems in the department laboratory, or by using distance education technologies such as augmented reality, virtual reality, or mobile technologies. The tests will include electrical systems such as lighting, power seats, power door locks, cruise controls, electric windows, electronic dashboards, radios, windshield wipers, or other systems. This course allows students who reside at a distance from training centers to complete certification requirements. This course is complemented by work experience, AUTO 161 lecture, and AUTO 161L lab.

Prerequisite
None

Recommended Preparation
"C" grade or higher or "Pass" in AUTO 161L Electrical Diagnosis and Repair Laboratory or equivalent.

Entrance Skills
Without the following skills, competencies, and knowledge, students entering this course will be highly unlikely to succeed:
1) Demonstrate the ability to test electrical circuits by location and function
2) Demonstrate voltage drop tests of a circuit
3) Demonstrate resistance tests of components and circuits
4) Demonstrate current flow using a wiring diagram
5) Perform various battery tests
6) Perform various charging and starting system tests
7) Perform electrical circuit functions
8) Perform scan tool function tests
9) Attain and describe parameter identification data (PID) using scan tools
10) Use the workshop manual to perform electrical tests

Course Content
1) Department Safety Test Written examination
2) Tests using distance education technologies
3) Tests using virtual reality or mobile technology

Course Objectives
Students will be able to:
1) Demonstrate navigation of manufacturer specific repair information for repair
2) Demonstrate knowledge of electrical theory and operation through actual repairs
3) Demonstrate knowledge of various electrical components and repair methods
4) Show the of use electrical measurement tools for critical measurements
5) Use actual tools for electrical tests of accurate failure analysis
6) Perform electrical tests using Scan tool technology as prescribed by the manufacturer
7) Document failure analysis on engine mechanical systems for warranty and customer pay services

8) Display a competent knowledge of starting and charging systems
9) Competently resolve electrical concerns for appropriate repairs
10) Display ability to read and interpret wiring diagrams

Method of Evaluation
A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, and skills demonstration.
1) Skills-based summative assessment that measures students' ability to successfully complete the NATEF tasks related to diagnosis, replacement, repair, testing of automotive electrical systems.
2) Practical exercises that measure students' progress toward mastering tasks related to diagnosis, replacement, repair, testing of electrical related systems and components.
3) A student portfolio will be used to show student skill mastery of engine competencies.
4) Web based training modules
5) Performance projects used to evaluate student ability to navigate repair procedures
6) Live student demonstrations or actual diagnosis and repairs.

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.
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 artifacts of skills demonstrations

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

Exit Skills
Students having successfully completed this course exit with the following skills, competencies, and/or knowledge:
1) During a recorded or live test, demonstrate the ability to test electrical circuits by location and function.
2) Diagnose and repair starting, charging, and electrical circuits.

3) Demonstrate various electrical tests including resistance, voltage drop, and current.
4) Perform scan tool function tests including PID monitoring, actuations, and maps.
5) Use the workshop manual to correctly perform electrical diagnosis and repair procedures.

Student Learning Outcomes

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

1) Accurately diagnose electrical system conditions.
2) Correctly display repair of electrical system problems.
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.