

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

Automotive Technology 162T – Electronics Diagnosis and Repair Assessment Test Out

1.5 hours laboratory, .5 unit

Catalog Description

This assessment course includes summative and criterion tests for students to prove knowledge skills and abilities to perform diagnosis and repair of automotive electronic systems in the department laboratory; or by using distance education technologies such as augmented reality, virtual reality, or mobile technologies. The tests will include electronic component diagnosis and repair using scan tools, digital multi-meters, and lab-scopes. This course allows students who reside at a distance from training centers to complete certification requirements. This course is complemented by work experience, AUTO 162 lecture, and AUTO 162L lab.

Prerequisite

None

Recommended Preparation

“C” grade or higher or “Pass” in AUTO 161T Electrical Diagnosis and Repair Assessment Test Out.

Entrance Skills

Without the following skills, competencies, and knowledge, students entering this course will be highly unlikely to succeed:

- 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.

Course Content

- 1) Department Safety Test
- 2) Written examination
- 3) Electronic tests using distance education technologies
- 4) Electronic tests using virtual reality or mobile technologies

Course Objectives

Students will be able to:

- 1) Demonstrate navigation of manufacturer specific repair information for repairs
- 2) Demonstrate knowledge of electronic systems theory and operation through actual repairs
- 3) Demonstrate knowledge of various electronic components and repair methods
- 4) Access, record, and internet electronic data using PID mapping
- 5) Use scan tools, digital multi-meters, and lab-scopes to diagnose electronic concerns
- 6) Test potentiometers, Hall-effect, variable reluctance, thermistors and related sensors
- 7) Document failure analysis on electronic systems for warranty and customer pay services
- 8) Display a competent knowledge of automotive electronic systems.
- 9) Competently resolve electronic concerns for appropriate repairs

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 required ASE tasks related to diagnosis, replacement, repair, and testing of automotive electronic systems.
- 2) Practical exercises that measure students' progress toward mastering tasks related to diagnosis, replacement, repair, and testing of automotive electronic systems.
- 3) A student portfolio will be used to show student skill mastery of electronic 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 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:** assigned course materials, manuals, content on websites, and more.
2. **Writing:** assignments where students describe the required tasks related to diagnosis, replacement, repair, and testing of electrical circuits and components, and more.
3. **Other:** web-based training modules (pass online pretests prior to laboratory "Test Out"), portfolio performance projects related to electrical circuits and components, and more.

Texts and References

- 1) Required (representative examples):
 - a. Student workbooks – will be provided electronically.
 - b. Required: VanGelder, Kirk. Fundamentals of Automotive Technology. Jones and Bartlett Learning, 2023.
 - 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) Demonstrate computer input and output tests and activation using s scan tool
- 2) Obtain and describe normal and abnormal waveforms using a lab-scope
- 3) Test thermistor, potentiometer, variable reluctance, pressure, Hall-effect and related sensors
- 4) Graph and interpret system data using PIDS on a scan tool
- 5) Diagnose and repair computer communication networking faults

- 6) Describe types and functions of computer memory including RAM, ROM, and PROM
- 7) Demonstrate proper diagnosis and repair of electronic system concerns

Student Learning Outcomes

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

- 1) Accurately diagnose automotive electronic system conditions.
- 2) Correctly repair automotive electronic 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.