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

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

AUTOMOTIVE TECHNOLOGY 194T – DIESEL ENGINE PERFORMANCE AND DIAGNOSIS ASSESSMENT TEST OUT

1.5 hours laboratory, 0.5 units

Catalog Description
This portfolio assessment course includes summative and criterion tests for students to prove knowledge, skills, and abilities to perform diagnosis and repair of diesel engine performance systems on vehicles in the department laboratory, or by using distance education technologies such as augmented reality or virtual reality. The tests will include recorded and live student demonstrations used for observation and assessment. This course allows a student residing at a distance from training centers to complete certification requirements prior to performing warranty service at a dealership. This course is the assessment of AUTO 194 Diesel Engine Performance and Diagnosis lecture, AUTO 194L Diesel Engine Performance and Diagnosis Lab, and is complemented by Work Experience at a dealership.

Prerequisite
None

Recommended Preparation
"C" grade or higher or "Pass" in AUTO 162T Electronics Diagnosis and Repair Assessment Test Out or the equivalent.

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

Course Content
Department Safety Test
Written examination
Hands on tests using Ford training vehicles and test equipment in the department laboratory
Hands on tests using distance education technologies
Hands on tests using virtual reality or mobile technologies

Course Objectives
Students will be able to:
1) Demonstrate and describe standardized safety and hazardous waste handling practices.
2) Show successful navigation of manufacturer specific repair information for appropriate repairs of diesel engines.
3) Demonstrate and describe the fundamentals of diesel engine theory and operations.
4) Demonstrate knowledge of various diesel engine components and apply the appropriate repairs.

5) Demonstrate and describe the ability to perform mechanical diesel engine performance tests.
6) Demonstrate and describe the ability to perform engine performance tests using Scan tools.
7) Proficiently document failure analysis for warranty and customer pay services.
8) Demonstrate actions to repair diesel engine performance systems.
9) Demonstrate the ability to diagnose and repair diesel fuel management systems.
10) Demonstrate the ability to diagnose and repair exhaust and intake air systems.
11) Demonstrate the ability to use codes and symptoms to follow pinpoint tests to diagnose related DTC's
12) Test high-pressure oil system tests and understand the operation of various common rail engines and designs.

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 necessary ASE tasks related to diagnosis, replacement, repair, testing of automotive diesel engine systems.
2) Practical exercises that measure students' progress toward mastering tasks related to diagnosis, replacement, repair, testing of diesel engine systems.
3) Student portfolio of competencies record book will contain student artifacts.
4) Web based training modules.
5) Performance projects.

Special Materials Required of Student
1) Approved safety glasses
2) High speed internet connection
3) Students will have access to testing tools and equipment while on campus and by remote assistance software
4) Appropriate dress code is required while in the lab on campus

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) All web based training must be completed prior to "Test Out"
4) Student must pass online pretests prior to laboratory tests

Texts and References
1) Required (representative examples):
   a. Student workbooks – will be provided electronically.
   b. Required:-CDX Light Vehicle Diesel Engines, 2019, **ISBN:** 9781284196696
   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 conditions of diesel engine performance fuel and exhaust systems.
2) Diagnose diesel engine performance fuel system problems by navigating the workshop manual based on symptoms or codes.
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.