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

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

AUTOMOTIVE TECHNOLOGY 181L – ENGINE PERFORMANCE I IGNITION AND FUEL SYSTEMS LABORATORY

3 hours laboratory, 1 unit

Catalog Description
This laboratory course demonstrates proper inspection and diagnostic techniques for various engine performance symptoms and conditions, including ignition and fuel systems operations. This course is the laboratory practice opportunity for students taking courses AUTO 181 Engine Performance I Ignition and Fuel Systems lecture, AUTO 181T Engine Performance I Ignition and Fuel Systems Assessment Test Out, and for students taking Work Experience to attain required ASE competencies.

Prerequisite
None

Course Content
1) Lecture:
    a. Introduction and safety
    b. Gasoline engine fundamental tests
    c. Engine operation parameter measurement and diagnosis
    d. Ignition system operation, testing and servicing
    e. Gasoline cooling system operation, testing and servicing
    f. Gasoline fuel system operation and service
    g. Sensor PID mapping and normal values
    h. Introduction to solid state electronics sampling
    i. Voltage and resistance measurements
    j. Microprocessors, computers, logic systems
    k. Input devices
    l. Output devices
    m. Computer-controlled gasoline fuel injection systems
    n. Workshop navigation based on codes or symptoms

Course Objectives
Students will be able to:
1) Identify the operation of various engine performance sensors and actuators.
2) Use a scan tool to select PIDs and monitor normal system operation.
3) Identify faults and monitor changes in system operation using a scan tool.
4) Use PC/ED, wiring diagrams, and workshop manuals to diagnose an engine performance concern.
5) Use the SSCC diagnostic process to diagnose an engine performance concern.
6) Follow a pinpoint test to perform various tests on engine performance related components.
7) Identify the root cause of an electronic engine performance concern.

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 tasks related to diagnosis, replacement, repair, testing of automotive engine performance systems.
2) Practical exercises that measure students' progress toward mastering tasks related to diagnosis, replacement, repair, testing of engine performance systems.
3) Student portfolio of competencies record book.
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.
4) Safety dress code is required during participation.
5) Computer, tablet, or smart device with large screen

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
5) Portfolio will be used to display competencies

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 demonstrate repair of various conditions of engine performance systems.
2) Identify and diagnose an engine performance system problem 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.