

SYLLABUS

DIVISION: Business & Engineering Technologies **REVISED: Fall Semester 2012**
CURRICULA IN WHICH COURSE IS TAUGHT: Automotive Analysis and Repair
COURSE NUMBER/TITLE: AUT 122-01 Automotive Fuel Systems II
CREDIT HOURS: 4 HOURS/WEEK LECTURE: 3 HOURS/WEEK LAB: 3 LEC/LAB COMB: 6

I. CATALOG DESCRIPTION:

Introduces service, and diagnosis; basic fuel injection theory and operation; electronic fuel injection; automotive computers with diagnosis, servicing, and adjustments and fuel system component replacement.

II. RELATIONSHIP OF THE COURSE TO CURRICULA OBJECTIVES IN WHICH IT IS TAUGHT:

- I. Demonstrate technical competencies and skills in automotive engine performance.
- II. Demonstrate punctuality and reliability acceptable to the automotive repair industry.
- III. Demonstrate an understanding of the economic costs of automotive vehicle repair.
- IV. Use safety equipment and procedures required for the operations being performed.
- V. Read and interpret technical information required for projects and assignments.
- VI. Demonstrate and maintain a clean, orderly, safe and attractive work place and maintain a personal appearance that will enhance that work place.

III. REQUIRED BACKGROUND:

AUT 121 and AUT 242 are required prerequisites. AUT 211 must be taken in conjunction with AUT 122.

Course textbook must be available for use and study

A basic hand tool set must be available and work clothes must be worn in lab

IV. COURSE CONTENT:

Computer controlled carburetors history and overview

Continuous injection systems

Throttle body injection systems

Port injection systems

Computer interface

Computer sensor and actuators

Computer control of emission devices

Computer diagnostic procedures

Fuel system service and maintenance

Students will work to show competency in the performance of the following tasks:

ASE Task List

1. Diagnose emission failures caused by computer engine controls.
2. Perform analytic/diagnostic procedures with on-board computer systems.
3. Inspect and test sensor. Actuators and circuits of computer engine control system.
4. Read and interpret technical information.
5. Use VIN to identify engine control system.

6. Diagnose driveability problems of fuel-injected vehicles.
7. Inspect and test mechanical and electrical fuel pumps and control systems.
8. Inspect and test cold enrichment system.
9. Inspect and test fuel injection pressure regulation system.
10. Remove, clean and install throttle body injector.
11. Inspect, test and clean fuel injectors.
12. Inspect and test throttle body mounting and air induction system.
13. Check and adjust idle speed and fuel mixture.
14. Inspect and test vacuum and electrical components of fuel system.
15. Diagnose the emission problems caused by idle and deceleration control system failures.
16. Inspect and test wiring, hoses and components of idle control system.
17. Inspect and test electrical/vacuum deceleration control components.
18. Diagnose EGR system failures.
19. Inspect and test EGR system valves and passages.
20. Inspect and test EGR system vacuum/pressure controls, filters and hoses.
21. Inspect and test catalytic converter system components.
22. Diagnose emission problems caused by intake air temperature control system failures.
23. Inspect and test intake air temperature control system components.
24. Diagnose emission problems caused by early fuel evaporation control system failures.
25. Inspect and test early fuel evaporation control system components.
26. Diagnose emission problems caused by evaporative emission control system failures.
27. Inspect and test evaporative emission control system components.

V. LEARNER OUTCOMES:

Evaluated by written tests (T or F, short answer, multiple choice):

1. List the advantages of a fuel injection system.
2. List the disadvantages of a fuel injection system.
3. Identify the fuel parts of a fuel injection system.
4. Identify the electronic parts of a fuel injection system.
5. Identify the test procedures to troubleshoot the electronic system.
6. Identify the test procedures to troubleshoot the fuel system.
7. List the different operation systems used to pulse the fuel injectors.

Program Outcomes:

1. Students will demonstrate the ability to use an automotive scan tool and a multi-meter to retrieve information and diagnose a modern automobile.
2. Students will work in teams to complete the disassembly and reassembly of automotive assemblies.
3. Students will demonstrate the use of precision measurement tools such as an outside micrometer and a torque wrench.
4. Students will complete all assigned lab worksheets on modern automobile systems.
5. Students will successfully complete a Shop Safety Course.

VI. Evaluation

Classroom activities will be evaluated by means of written tests home and classroom assignments by the criteria in the course outline

Evaluated by shop practice (shop instructor observation):

1. Diagnose fuel leaks.
2. Test and correct fuel delivery systems.
3. Replace air fuel filtration units
4. Remove and replace injector
5. Test fuel pressure.
6. Test and clean fuel injectors
7. Remove and replace electrical sensors
8. Test and diagnose electronic fuel delivery systems.
9. Diagnose computer system diagnostic trouble codes
10. Diagnose fuel system problems using computer diagnostic scan tools.
11. Use electricity and fuel training simulators
12. 75% of the students will be able to complete these assignments

VII. The Following General Education Objectives Will Be Addressed in This Course:

Communication
Learning Skills
Critical Thinking
Interpersonal Skills and Human Relations
Understanding Science and Technology