



# MONROE COUNTY COMMUNITY COLLEGE

## Course Outcome Summary

### Required Program Core Course

#### AST 202 Engine Performance I

##### Course Information

Division	ASET
Contact Hours	105 ✓
Theory	15 ✓
Lab Hours	90 ✓
Total Credits	4 ✓

Pre requisites – AST 103

Corequisite – AST 105

##### Course Description

This course focuses on automotive engine performance pertaining to the on board diagnostic (OBD II) system, the sensors that report information to the engine controller and the fuel system will be the focus of this course. Students will have an opportunity to utilize the various tools and procedures in order to understand the operation, diagnose malfunctions, and repair faults in these systems.

This course is a required core course for students pursuing a (n) AAS in *Automotive Technologies*

##### Program Outcomes Addressed by this Course:

Upon successful completion of this course, students should be able to meet the program outcomes listed below:

- A. Demonstrate the correct method of utilizing automotive service tools and equipment
- B. Identify all related system diagnostic/repair information within automotive service information
- C. Employ safe and professional work habits while conducting typical automotive service procedures.
- D. Explain how the various systems of an automobile work
- E. Demonstrate correct service procedures in the various automotive systems
- F. Test and diagnose the proper operation of the various automotive systems

##### Course Outcomes

In order to evidence success in this course, the students will be able to:

#### 1. Understand and demonstrate computerized control system operation diagnosis and repair

This outcome is relevant to program outcomes: (A) , (B),(C),(D), (E) and (F)

- a) Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable.
- b) Access and use service information to perform step-by-step (troubleshooting) diagnosis.
- c) Perform active tests of actuators using a scan tool; determine necessary action.
- d) Describe the importance of running all OBDII monitors for repair verification.



## AST 202 Engine Performance I

- e) Diagnose the causes of emissions or drivability concerns with stored or active diagnostic trouble codes; obtain, graph, and interpret scan tool data.
- f) Diagnose emissions or drivability concerns without stored diagnostic trouble codes; determine necessary action.
- g) Inspect and test computerized engine control system sensors, powertrain/engine control module (PCM/ECM), actuators, and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO); perform necessary action.

### 2. Understand and demonstrate ignition system operation diagnosis and repair

This outcome is relevant to program outcomes: (A) , (B),(C),(D), (E) and (F)

- a) Diagnose (troubleshoot) ignition system related problems such as no-starting, hard starting, engine misfire, poor drivability, spark knock, power loss, poor mileage, and emissions concerns; determine necessary action.
- b) Inspect and test crankshaft and camshaft position sensor(s); perform necessary action.
- c) Inspect, test, and/or replace ignition control module, powertrain/engine control module; reprogram as necessary.
- d) Remove and replace spark plugs; inspect secondary ignition components for wear and damage.

### 3. Understand and demonstrate fuel, air induction, and exhaust System operation, diagnosis and repair

This outcome is relevant to program outcomes: (A) , (B),(C),(D), (E) and (F)

- a) Diagnose (troubleshoot) hot or cold no-starting, hard starting, poor drivability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems; determine necessary action.
- b) Check fuel for contaminants; determine necessary action.
- c) Inspect and test fuel pumps and pump control systems for pressure, regulation, and volume; perform necessary action.
- d) Replace fuel filter(s).
- e) Inspect, service, or replace air filters, filter housings, and intake duct work.
- f) Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air.
- g) Inspect and test fuel injectors.
- h) Verify idle control operation.
- i) Check and refill diesel exhaust fluid (DEF).
- j) Test the operation of turbocharger/supercharger systems; determine necessary action.