COURSE OUTLINE

Revised By: Howard Andersen 2013

DEPARTMENT:	Automotive Technology
CURRICULUM:	Automotive Technology
COURSE TITLE:	Emission Controls and Diagnostic Equipment
COURSE NUMBER:	AUT 142
TYPE OF COURSE:	Vocational Preparatory
COURSE LENGTH:	Normally 4 weeks
CREDIT HOURS:	6
LECTURE HOURS:	20 hours
LAB HOURS:	80 hours
CLASS SIZE:	20 maximum
PREREQUISITES:	MVM 100 (Introduction to Automotive Technology I), MVM 102 (Introduction to Automotive Technology II), AUT 100 (Introduction to Electricity), AUT 102 (Advanced Electrical Systems), AUT 104 (Automotive Electronics), AUT 106 (Basic Power Accessories), AUT 134 (Introduction to Drivability), AUT 138 (Advanced Drivability and Fuel Systems), AUT 140 (Engine Computers), basic math skills, and 9th grade or higher reading level (as evidence by appropriate placement test scores), and/or instructor permission.

COURSE DESCRIPTION:

Contents include: safety, emission control design and operation, positive crankcase ventilation, exhaust gas recirculation, exhaust gas treatment, evaporative emission controls, spark timing controls, early fuel evaporation, secondary AIR, catalytic converters, OBD I and OBD II systems, exhaust gas analyzers, as well as removal and installation of emission control components from vehicles. In addition the function and construction of each component, and their diagnosis and service procedures will be covered. Instruction in safety, environmental awareness, human relations and leadership are taught as an integral part of this unit.

STUDENT LEARNING OUTCOMES ADDRESSED:

1. Critical Thinking – Use problem solving skills to diagnose and repair emission control problems. (SLO 4.1)
2. Technology - Proper use and care of emission control tools and equipment. (SLO 5.1)

PROGRAM OUTCOMES:

1. Inspect, diagnose, disassemble, repair, replace and service each of the major systems in various types of vehicles. (SLO 4.1)
2. Locate sources, make parts write-ups, calculate costs and explain repair or service. (SLO 2.1, 2.2 & 7.1)
3. Handle customer needs, complaints, questions and special challenges. (SLO 3.1 & 3.2)
4. Access and apply manufacturer's specifications in repair and replacement. (SLO 7.1)
5. Work safely and responsibly within all shop safety and environmental guidelines and standards. (SLO 6.4 & 6.5)
6. Demonstrate ability to pass the ASE test required for NATEF certification. (SLO 1.1, 1.2 & 7.1)
7. Communicate and document service records. (SLO 2.1)
8. Compute costs, time and measurements. (SLO 2.1, 2.2 & 7.1)
9. Work independently and in groups to service, repair, test and maintain vehicles. (SLO 3.1 & 6.3)
10. Use technology to test vehicles. (SLO 5.1)
11. Work with accuracy, dependability, proficiency and in a timely manner, when servicing equipment. (SLO 6.3 & 6.4)

GENERAL COURSE OBJECTIVES:

At the end of the course the student will:

1. Explain and demonstrate safety as it applies to the automotive industry.
2. Explain the operation and service of positive crankcase ventilation
3. Explain the operation and service of exhaust gas recirculation.
4. Explain the operation and service of secondary AIR.
5. Explain the operation and service of EVAP.
6. Explain the operation and service of spark timing controls.
7. Explain the operation and service of early fuel evaporation.
8. Explain the operation and service of catalytic converters.
9. Explain the operation and service of OBD I and OBD II systems.
10. Understanding an OBD II drive cycle
11. Understanding and an opportunity to become Automotive Emission Specialist
12. Explain how to operate and use exhaust gas analyzers.
11. Demonstrate proficiency in NATEF competencies.

TOPICAL OUTLINE:	APPROX. HOURS
1. Automotive safety	5
2. Positive crankcase ventilation	5
3. Exhaust gas recirculation	10
4. Secondary AIR	5
5. Evaporative emission controls	5
6. Spark timing controls	10
7. Early fuel evaporation	2
8. Catalytic converters	10
9. OBD I and OBD II systems	20
10. Exhaust Gas Analyzers	10
11. Washington State Emission check program	18
Total	100