Automotive & Mobile Equipment Service and Repair

Course Description

This capstone semester course in Automotive and Mobile Equipment Repair and Service will build upon the previous knowledge of skills from the Mobile Equipment Program of Study. Advanced diagnostic and repair procedure will be addressed in each of the major systems of engine repair, i.e. Ignition, fuel, cooling, lubrication, electronics, drive train, suspension & chassis, brakes, and engine performance.

Course Code:

Program(s) of Study to which This Course Applies

- Mobile Equipment Maintenance

Course Framework	Reference Standards	Academic Crosswalk
Standard 1. Students will explore and present information on a selected career in the Automotive or Mobile Equipment Repair Industry.		
Benchmark 1.1 The student will research into various careers. <u>Sample performance indicators:</u> • Prepare a 1-2 page paper and 6 slide power point to be presented to the class. • Use a rubric evaluation.		LA12.1.5.b (1) LA12.1.6.d (1) LA12.1.6.f (1) LA12.2.1.f (1) LA12.2.2.a (1) LA12.2.2.b (1) LA12.2.2.c (1) LA12.3.1.a (1) LA12.3.1.c (1)
Benchmark 1.2 The student will use the internet, guidance counselor, job shadow, and college visits to explore careers. <u>Sample performance indicators:</u>	CAPS/COPE NCE	LA12.1.5.b (1) LA12.1.6.d (1) LA12.1.6.f (1) LA12.2.1.f (1)

• Take a personal interest inventory. • Job shadow a career of interest. • Visit colleges of interest.		LA12.2.2.a (1) LA12.2.2.b (1) LA12.2.2.c (1) LA12.3.1.a (1) LA12.3.1.c (1)
Standard 2. Students will understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.	TRC206	
Benchmark 2.1 The student will follow all personal safety procedures and OSHA regulations. <u>Sample performance indicators:</u> • Practice wearing safety gear. • Adhere to MSDS guidelines.	OSHA, MSDS	SC12.1.1.d (2) LA12.1.5.b (1) LA12.1.6.d (1) LA12.1.6.f (1)
Benchmark 2.2 The student will follow all safety procedures while operating tools and equipment. <u>Sample performance indicators:</u> • Practice safe use of tools and equipment. • Comply with environment regulations and disposal.	OSHA, MSDS EPA	SC12.1.1.d (2)
Standard 3. Students will utilize scan tool diagnostic or computerized diagnostic equipment to diagnosis vehicle systems warning lights and repair procedures.		
Benchmark 3.1 The student will use computerized scan tool equipment to diagnose and repair electronic systems on vehicles. <u>Sample performance indicators:</u> • Demonstrate the appropriate use of the tools. • Retrieve diagnose codes from PCM. • Graph computer data. • Record and clear codes.	NATEF VIII.B.1-6	SC12.1.1.e (1) MA12.1.1 (1)
Standard 4. Students will receive advanced instruction along with diagnostic and		

repair opportunities for the sub-systems of cooling and lubrication.		
Benchmark 4.1 The student will test and trouble shoot the cooling system based on manufacturing procedures and specification. Sample performance indicators: • Locate and retrieve manufacturing procedures and specifications for diagnosing. • Perform necessary diagnosis. • Produce a work order for needed repair. • Create customer price quote.	NATEF I.D.3-7	LA12.1.5.b (1) LA12.1.6.d (1) LA12.1.6.f (1) LA12.2.2.c (1)
Benchmark 4.2 The student will follow diagnostic procedures on the cooling systems appropriate repairs will be made by the student following manufactures repair procedures. Sample performance indicators: • Locate and retrieve manufacturing procedures for repairing cooling systems. • Perform necessary repairs properly. • Complete work order and prepare the car for deliver to customer.	NATEF I.D.8-11,14	MA12.1.3 (1) CCSS: MA(N-CN) (1) LA12.1.5.b (1) LA12.1.6.d (1) LA12.1.6.f (1) LA12.2.2.c (1)
Benchmark 4.3 The student will follow instructions, perform checks, and service of the lubrication system. Sample performance indicators: • Locate and retrieve manufacturing procedures for repairing lubrication systems. • Perform necessary repairs properly. • Complete work order and prepare the car for deliver to customer.	NATEF I.D.1 NATEF I.A.1	LA12.1.5.b (1) LA12.1.6.d (1) LA12.1.6.f (1) LA12.2.2.c (1)
Standard 5. Students will receive advanced knowledge and instruction on equipment used to diagnose and repair chassis and suspension systems.		
Benchmark 5.1 The student will perform chassis and suspension routine maintenance and repair procedures according to manufacturer's specifications. Sample performance indicators: • Locate and retrieve manufacturing procedures for repairing chassis and suspensions. • Perform necessary repairs properly. • Complete work order and prepare the car for deliver to customer.	NATEF IV.A.1-4 NATEF IV.C.1-11 NATEF IV.D.1,2	LA12.1.5.b (1) LA12.1.6.d (1) LA12.1.6.f (1) LA12.2.2.c (1)

Benchmark 5.2 The students will design and manufacture a chassis and suspension system for a vehicle or modification to an existing system. <u>Sample performance indicators:</u> • Locate and retrieve manufacturing procedures for repairing chassis and suspension. • Perform necessary repairs properly. • Complete work order and prepare the car for deliver to customer. • Design a chassis and suspension for power drive (Electrical Car).		MA12.1.3 (1) CCSS: MA(N-CN) (1) LA12.1.5.b (1) LA12.1.6.d (1) LA12.1.6.f (1) LA12.2.2.c (1)
Standard 6. Students will be able to diagnose the drive train, brake components inspection and repair.		
Benchmark 6.1 The student will perform automatic drive train routine maintenance and repair procedures according to manufacturer's specifications. <u>Sample performance indicators:</u> • Locate and retrieve manufacturing procedures for repairing drive train. • Perform necessary repairs properly. • Complete work order and prepare the car for deliver to customer.	NATEF II.A.1-6,13 NATEF II.B.3,4,6	MA12.1.3 (1) CCSS: MA(N-CN) (1) LA12.1.5.b (1) LA12.1.6.d (1) LA12.1.6.f (1) LA12.2.2.c (1)
Benchmark 6.2 The student will perform drive line and clutch routine maintenance and repair procedures according to manufacturer's specifications. <u>Sample performance indicators:</u> • Locate and retrieve manufacturing procedures for repairing drive line and clutch. • Perform necessary repairs properly. • Complete work order and prepare the car for deliver to customer.	NATEF III.A.1-5 NATEF III.B.1-7 NATEF III.D.1,3,4	LA12.1.5.b (1) LA12.1.6.d (1) LA12.1.6.f (1) LA12.2.2.c (1)
Benchmark 6.3 The student will perform brake components routine maintenance and repair procedures according to manufacturer's specifications. <u>Sample performance indicators:</u> • Locate and retrieve manufacturing procedures for repairing drive train and brake components. • Perform necessary repairs properly. • Complete work order and prepare the car for deliver to customer.	NATEF V.A.1-4 NATEF V.B.1-13 OSHA1910.1001App F	LA12.1.5.b (1) LA12.1.6.d (1) LA12.1.6.f (1) LA12.2.2.c (1)
Standard 7. Students will be able to diagnose and correct the causes of ignition, emissions or drivability concerns with diagnostic trouble codes.		

Benchmark 7.1 The student will demonstrate how to use a scan tool appropriate diagnose the cause of the malfunction indicator light. Sample performance indicators: • Obtain, graph, and interpret scan tool data. • Identify component and cause of failure. • Perform repair properly.	NATEF VIII.C.1-4 NATEF VIII.E.1-12	

Reference Standards Sources

- KS = Career Clusters Knowledge and Skills Statements. Revised 2008. National Career and Technical Education Foundation, Silver Spring, MD. www.careerclusters.org.
- NATEF = National Automotive Technician Education Foundation 2008 Task List
- MSDS = Material Safety Data Sheet
- OSHA = Occupational Safety and Health Administration
- EPA = Environmental Protection Agency
- TRC = Transportation Research Center

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Revision date *(if changes made after final draft)*:

Other Information

Suggestions for innovative teaching and learning strategies:	•
Related assessments:	•
Extended learning opportunities:	• SkillsUSA – Automotive Service Technology competition