

COURSE MEC2070: EMISSION CONTROLS**Level:** Intermediate**Theme:** Propulsion Systems**Prerequisite:** None**Description:** Students describe the importance of controlling emissions and the technology applied to vehicles to meet prescribed standards.**Parameters:** Access to specialized equipment and resources related to analyzing and testing emission control.**Supporting Courses:** MEC2030 Lubrication & Cooling
MEC2040 Fuel & Exhaust Systems
MEC2060 Ignition Systems**Curriculum and Assessment Standards**

General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate safe work practices when working with emission control systems 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> observed performance related to: <ul style="list-style-type: none"> safety procedures in use of tools and equipment related to vehicle emissions appropriate selection of and use of protective equipment recognition and control of hazards associated with engine emissions. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Emission Controls, Part 1, MEC2070-1</i></p> <p><i>Standard</i> <i>Performance rating of 2 on each criteria</i></p>	10
	<ul style="list-style-type: none"> list and describe vehicle pollutants and their effects on the environment <ul style="list-style-type: none"> observed performance related to: <ul style="list-style-type: none"> listing vehicle emissions explaining exhaust emissions and their effects on the environment stating regulations pertaining to exhaust emission levels comparing emissions produced by gasoline as compared to alternate fuels. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Emission Controls, Part 2, MEC2070-1</i></p> <p><i>Standard</i> <i>Performance rating of 2 on each criteria</i></p>	15

COURSE MEC2070: EMISSION CONTROLS (continued)

General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> • describe types and characteristics of pre- and post-combustion emission systems • identify emission control components • diagnose and service emission control systems • demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> • ability to identify and describe: <ul style="list-style-type: none"> – types of pre- and post-combustion emission control systems – parts of pre- and post-combustion emission systems – the function and operation of pre- and post-combustion emission systems. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Emission Controls, Part 3, MEC2070-1</i></p> <p><i>Standard</i> <i>Performance rating of 2 on each criteria</i></p> <ul style="list-style-type: none"> • observed performance associated with: <ul style="list-style-type: none"> – locating and identifying components on a vehicle – describing how components work together to reduce emissions – evaluating a given system for efficiency. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Emission Controls, Part 4, MEC2070-1</i></p> <p><i>Standard</i> <i>Performance rating of 2 on each criteria</i></p> <ul style="list-style-type: none"> • observed performance related to: <ul style="list-style-type: none"> – connection of a gas analyzer to a vehicle – reading and recording the exhaust emissions – analyses of emission system functions – servicing emission control systems. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Emission Controls, Part 5, MEC2070-1</i></p> <p><i>Standard</i> <i>Performance rating of 2 on each criteria</i></p> <ul style="list-style-type: none"> • observations of individual effort and interpersonal exploration during the learning process. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>15</p> <p>25</p> <p>35</p> <p>Integrated throughout</p>

MODULE MEC2070: EMISSION CONTROLS (continued)

Concept	Specific Learner Expectations	Notes
Health/Safety Hazards	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • demonstrate knowledge of and follow lab safety procedures. • describe effect of vehicle emissions on the environment and specifically on human life. 	<p>Discuss the effects of smog and carbon monoxide.</p>
Identification/Function	<ul style="list-style-type: none"> • list types and where vehicle pollutants are created • explain how these pollutants are created • identify regulations that dictate maximum pollutant levels • identify and demonstrate knowledge of the operation of the following pre-combustion control systems: <ul style="list-style-type: none"> – crankcase ventilation system – exhaust gas recirculation system – ignition spark control systems – computerized engine controls – evaporative control systems – engine design modifications; i.e., combustion chamber, piston, cylinder head, manifold and air induction design • identify and demonstrate knowledge of the operation of the following post-combustion control systems on several different types of vehicles: <ul style="list-style-type: none"> – air injection system – air aspirator system – catalytic converters 	

MODULE MEC2070: EMISSION CONTROLS (continued)

Concept	Specific Learner Expectations	Notes
Inspect/Service	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • demonstrate how to: <ul style="list-style-type: none"> – check and service positive crankcase ventilation system – check and service evaporative control system – check and service air injector system – check and service exhaust gas recirculation system – check catalytic converter – check and adjust spark control system – check computerized engine controls – using exhaust gas analyzer (if available), check emissions for a given vehicle. 	<p>As per manufacturer's specifications.</p> <p>All customer work should be checked by a certified technician.</p> <p>Check readings for hydrocarbons, carbon monoxide, oxygen and carbon dioxide levels.</p>