

2005 CTS AMENDMENTS to the Mechanics Guide to Standards and Implementation

Summary of Curriculum Changes

Prerequisite changes:

- MEC1040: Engine Fundamentals is no longer a prerequisite to:
 - MEC2060: Ignition Systems
 - MEC2070: Emission Controls

Section B

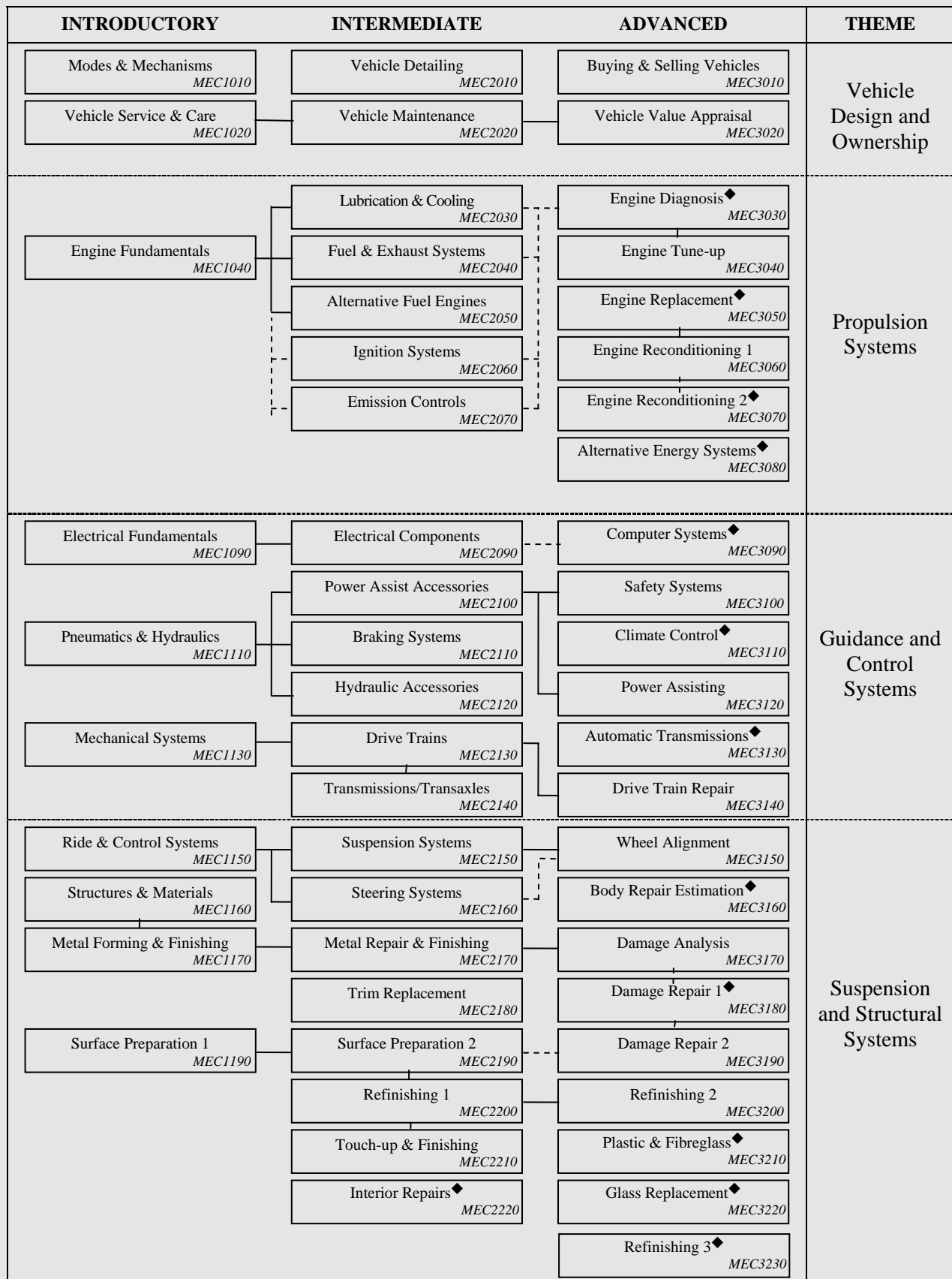
- **Remove** page B.5 (1997) and **replace** with new page B.5 (Revised 2005).

Section E

- **Remove** pages E.21 and E.25 (1997) and **replace** with new pages E.21 and F.25 (Revised 2005).

SCOPE AND SEQUENCE

MECHANICS



—— Prerequisite - - - - Recommended sequence

♦ Refer to specific courses for additional prerequisites.

COURSE DESCRIPTIONS

Course MEC1010: Modes & Mechanism

Students research, design, build and test a model of a transportation vehicle, using a simple power source, common materials and tools.

Course MEC1020: Vehicle Service & Care

Students develop knowledge, skills and attitudes to care for and service a motor vehicle.

Course MEC1040: Engine Fundamentals

Students investigate and describe operating principles, construction and applications of engines.

Course MEC1090: Electrical Fundamentals

Students identify and describe the operating principles and applications of electricity.

Course MEC1110: Pneumatics & Hydraulics

Students identify and describe the operating principles and applications of pneumatic and hydraulic systems.

Course MEC1130: Mechanical Systems

Students identify and describe the operating principles and applications of mechanisms used to transmit and control mechanical energy.

Course MEC1150: Ride & Control Systems

Students develop a basic knowledge of ride and control systems associated with vehicles.

Course MEC1160: Structures & Materials

Students identify the types of materials and components used in vehicle construction.

Course MEC1170: Metal Forming & Finishing

Students repair and re-form damaged metal panels.

Course MEC1190: Surface Preparation 1

Students assess the state of a painted surface, and use appropriate restoration procedures.

Course MEC2010: Vehicle Detailing

Students develop the skills required to restore and enhance the exterior finishes of a vehicle.

Course MEC2020: Vehicle Maintenance

Students perform the basic service requirements necessary to ensure adequate maintenance of a motor vehicle.

Course MEC2030: Lubrication & Cooling

Students diagnose, maintain and service the lubrication and cooling systems of a typical four-cycle gasoline engine.

Course MEC2040: Fuel & Exhaust Systems

Students diagnose, maintain and service the fuel and exhaust system of a typical four-cycle gasoline engine.

Course MEC2050: Alternative Fuel Engines

Students determine alternative fuels used to power motor vehicles.

Course MEC2060: Ignition Systems

Students identify the basic components and parts of ignition systems used on internal combustion engines, and service and repair an ignition system.

Course MEC2070: Emission Controls

Students describe the importance of controlling emissions and the technology applied to vehicles to meet prescribed standards.

Course MEC2090: Electrical Components

Students identify and describe the basic use and testing of the electrical components of a typical motor vehicle.

Course MEC2100: Power Assist Accessories

Students identify and explain the function of components and parts of power assist accessories.

Course MEC2110: Braking Systems

Students develop the necessary knowledge, skills and attitudes to diagnose, service and maintain a braking system according to accepted trade practices.

COURSE MEC2060: IGNITION SYSTEMS**Level:** Intermediate**Theme:** Propulsion Systems**Prerequisite:** None**Description:** Students identify the basic components and parts of ignition systems used on internal combustion engines, and service and repair an ignition system.**Parameters:** Access to multimeter, timing light, hand tools and related resources.**Supporting Courses:** MEC1090 Electrical Fundamentals
MEC1040 Engine Fundamentals**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"> follow electrical safety guidelines by accurately interpreting and using instruction manuals 	<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"> selection and use of resources and materials recognition of dangers of high voltages and currents. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Ignition Systems, Part 1, MEC2060-1</i></p> <p><i>Standard</i> <i>Performance rating of at least 2 on each criteria</i></p>	10
<ul style="list-style-type: none"> explain how a timed high voltage spark is achieved in magneto, point and electronic ignition systems 	<ul style="list-style-type: none"> ability to explain how the parts of magneto, point and electronic ignition systems function to produce timed ignition spark. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Ignition Systems, Part 2, MEC2060-1</i></p> <p><i>Standard</i> <i>Performance rating of 2 on each criteria</i></p>	20
<ul style="list-style-type: none"> recognize the drivability symptoms, and use visual and instrument checks to diagnose ignition system faults 	<ul style="list-style-type: none"> observed performance related to the ability to: <ul style="list-style-type: none"> visually diagnose ignition faults use instruments to diagnose faults analyze drivability symptoms. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Ignition Systems, Part 3, MEC2060-1</i></p> <p><i>Standard</i> <i>Performance rating of 2 on each criteria</i></p>	30

COURSE MEC2060: IGNITION SYSTEMS (continued)

General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> • service and repair an ignition system 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> • observed performance in: <ul style="list-style-type: none"> – servicing point ignition system – servicing electronic ignition system – correcting a defective system. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Ignition Systems, Part 3, MEC2060–1</i></p> <p><i>Standard</i> <i>Performance rating of 3 on each criteria</i></p>	40
<ul style="list-style-type: none"> • demonstrate basic competencies. 	<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>	Integrated throughout

Concept	Specific Outcomes	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 hazards involved when working with high voltages and currents. 	Be aware of the potential for shocks and burns.
Identification/Function	<ul style="list-style-type: none"> • list and describe the three common types of ignition systems • name the parts of a: <ul style="list-style-type: none"> – magneto – point type – electronic ignition system – computer-coil (distributorless ignition) 	Describe a distributorless ignition system.

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>