

MODULE MEC1130: MECHANICAL SYSTEMS**Level:** Introductory**Theme:** Guidance and Control Systems**Prerequisite:** None**Module Description:** Students identify and describe the operating principles and applications of mechanisms used to transmit and control mechanical energy.**Module Parameters:** Access to examples of mechanical units and related resources.**Curriculum and Assessment Standards**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> • demonstrate safe use of tools, and follow established lab procedures • describe principles and concepts related to the use of mechanisms to control and transmit force and motion in a mechanical system 	<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"> – following established shop/lab routines – proper selection and safe use of tools – use of guards and shields. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Mechanical Systems, Part 1, MEC1130-1</i></p> <p><i>Standard</i> <i>Performance rating of 2 on each criteria</i></p> <ul style="list-style-type: none"> • report listing/describing and providing examples of the following: <ul style="list-style-type: none"> – simple machines – types of mechanical motion – direct and indirect power transmission units – conversion of mechanical energy. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Mechanical Systems, Part 2, MEC1130-1</i></p> <p><i>Standard</i> <i>Performance rating of 1 or more on each criteria</i></p>	<p>10</p> <p>30</p>

MODULE MEC1130: MECHANICAL SYSTEMS (continued)

Concept	Specific Learner Expectations	Notes
<p>Identification/ Function</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • describe the application of mechanical systems that are found in all aspects of human endeavour • demonstrate the use of simple machines to change the: <ul style="list-style-type: none"> – direction in which a force acts – size of the force – place where the force acts. • identify and describe a mechanism that produces: <ul style="list-style-type: none"> – linear motion – reciprocating motion – oscillating motion – rotary motion – other • use a graph to describe the action of a cam as it changes rotary motion to linear motion • explain the difference between direct and indirection transmission of power • describe the purpose and types of: <ul style="list-style-type: none"> – shafts – couplers – universal joints – pins – others • demonstrate the use of simple machines to: <ul style="list-style-type: none"> – start and stop motion – change directions – increase or decrease speed – increase or decrease torque • describe the relationship between torque, velocity and gear ratios 	<p>Group activity.</p> <p>Consider bicycle drive mechanism and model engines.</p> <p>Use of sample transmissions/rear axles; e.g.:</p> <ul style="list-style-type: none"> • self-propelled lawn mowers • riding mowers • basic automobile, transmissions, drive shafts, differentials.

MODULE MEC1130: MECHANICAL SYSTEMS (continued)

Concept	Specific Learner Expectations	Notes
Identification/ Function (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • explain why friction has both positive and negative attributes • compare the coefficient of friction between two different materials • describe how friction can be increased or decreased in a mechanical system • calculate the mechanical advantage of one or more mechanisms to determine the efficiency of the system. • explain how mechanical energy can be changed to: <ul style="list-style-type: none"> – heat energy – electrical energy – fluid energy – other. 	Use/construct unit similar to oil additive demonstration unit.
Inspect/Service	<ul style="list-style-type: none"> • list, observe and service mechanical systems on a given vehicle. 	Service and repair a bicycle, rototiller, garden tractor, etc.