

MODULE AGR2120: SOILS MANAGEMENT 1 (SOIL PROPERTIES/CLASSIFICATION)**Level:** Intermediate**Theme:** Management and Conservation**Prerequisite:** None**Module Description:** Students examine soil formation and classification, conduct tests to determine the physical and chemical properties of soils, and they explain the impact of soil properties on productivity.**Module Parameters:** Access to a science laboratory and land laboratory.**Note:** Specific learner expectations in AGR2120 Soils Management 1 and AGR3120 Soils Management 2 are consistent with Soils Investigations (SOIL100–35) at Olds College, Alberta. Teachers should contact the Registrar’s Office, Olds College, regarding transfer of credit for competencies developed in this module and in AGR3120 Soils Management 2.**Supporting Module:** AGR1110 Resource Management and Conservation**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"> describe the origin and composition of soils in Western Canada 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> a theory test in which the student demonstrates knowledge of the origin and composition of soils in western Canada. <p><i>Assessment Tool</i> <i>Sample Test Items: Origin and Composition of Soils, Soils Investigations Facilitator’s Manual</i></p> <p><i>Standard</i> <i>Response indicating 75% mastery</i></p>	15

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(continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify physical properties of soils, and describe their relationship to soil productivity 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> given an Alberta grassland or forest soil profile, <ul style="list-style-type: none"> identifying characteristics of each master horizon determining the parent material and soil forming factors. <p><i>Assessment Tool</i> Soils Investigations I Assignment Book <i>Lab Investigations: Soil Profile Analysis, AGR2120-1</i></p> <p><i>Standard</i> <i>Complete all related exercises in the assignment book; conduct lab investigations to a standard of 2 on the rating scale</i></p>	15
	<ul style="list-style-type: none"> a theory test in which the student demonstrates knowledge of the physical properties of soil. <p><i>Assessment Tool</i> <i>Sample Test Items: Physical Properties, Soils Investigations Facilitator's Manual</i></p> <p><i>Standard</i> <i>Response indicating 75% mastery</i></p>	20
	<ul style="list-style-type: none"> given four soil samples, a soil texture triangle and Munsell colour chart: <ul style="list-style-type: none"> manually estimating the relative percentages of sand, clay and silt for each sample determining the textural class of each soil sample identifying the colour name and Munsell notation for each soil sample. <p><i>Assessment Tool</i> <i>Lab Investigations: Soil Texturing, AGR2120-2</i> <i>Soils Investigations Materials Kit</i></p> <p><i>Standard</i> <i>Conduct lab investigations using equipment/ supplies provided in the materials kit to a standard of 2 on the rating scale</i></p>	20

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(continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify chemical properties of soils, and describe their relationship to soil productivity 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> a theory test in which the student demonstrates knowledge of the chemical properties of soil. <p><i>Assessment Tool</i> <i>Sample Test Items: Chemical Properties, Soils Investigations Facilitator's Manual</i></p> <p><i>Standard</i> <i>Response indicating 75% mastery</i></p>	15
	<ul style="list-style-type: none"> given four soil samples, a pH test kit and an electrical conductivity meter: <ul style="list-style-type: none"> measuring soil pH for each soil sample measuring electrical conductivity for each soil sample. <p><i>Assessment Tool</i> <i>Lab Investigations: Soil Acidity and Conductivity, AGR2120-3</i> <i>Soils Investigations Materials Kit</i></p> <p><i>Standard</i> <i>Conduct lab investigations using equipment/ supplies provided in the materials kit to a standard of 2 on the rating scale</i></p>	15
<ul style="list-style-type: none"> demonstrate basic competencies. 	<ul style="list-style-type: none"> observations of individual effort and interpersonal interaction 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 Learner Expectations	Notes
Soil Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe major geological processes leading to the origin of soils in western Canada identify and describe factors that influence the formation of different kinds of soils; e.g.: <ul style="list-style-type: none"> climate living organisms parent materials topography time 	Contact Department of Instructional Design, Olds College, for additional support materials.

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(continued)

Concept	Specific Learner Expectations	Notes
Soil Development (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • describe the major components of soil and their relationship to soil productivity; e.g.: <ul style="list-style-type: none"> – minerals – organic matter – air – water • identify master horizons of a soil profile, and relate common horizon suffixes to soil forming factors • interpret and compare the soil profiles of forest and grassland environments • list and describe the soil orders of the Canadian System of Soil Classification; e.g.: <ul style="list-style-type: none"> – distinguishing characteristics – typical horizon sequences. 	<p>Assess a local piece of land regarding soil formation factors that have helped to shape soil to its present condition.</p> <p>Demonstrate the water-holding capacity of different soils.</p> <p>Construct soil profile diagrams.</p>
Physical Properties	<ul style="list-style-type: none"> • define soil texture and describe textural classes of soil • apply hand-texturing techniques to estimate the texture of a soil sample; e.g.: <ul style="list-style-type: none"> – dry consistence test – moist cast test – ribbon test • define soil structure and describe factors that influence the formation of soil structure • identify different types of soil structures, and relate soil structure to common soil horizons • explain the significance of colour as an indicator of soil conditions, and descriptors used to indicate soil colour • measure soil colour using the Munsell Soil Colour Chart • interpret relationships between physical properties of soil and plant growth. 	<p>Plan laboratory activities in hand texturing.</p> <p>Map soil zones of the prairie provinces.</p> <p>Plan for laboratory activities in measuring soil colour.</p>

