

SO 102
Soil Science
3 Credits

Instructor: JP Pettyjohn
Phone: 780 853 8624
Original Developer: Mel Mathison
Current Developer: JP Pettyjohn
Reviewer: John Lundy
Created: 10/1/1991
Revised: 04/01/2018
Approval: 09/01/2018

The Implementation Date for this Outline is 01/01/2018

Copyright©LAKELAND COLLEGE. Email: admissions@lakelandcollege.ca
2602 - 59 Avenue, Lloydminster, Alberta, Canada T9V 3N7. Ph: 780 871 5700
5707 College Drive, Vermilion, Alberta, Canada T9X 1K5. Ph: 780 853 8400
Toll-free in Canada: 1 800 661 6490



SO 102 Version: 21



Soil Science

Calendar Description

This course involves a study of the basic properties of soils. The course studies physical, chemical, and biological properties of soils to provide an understanding of how soils function as a growth medium in agriculture. The Soil Orders of the Canadian System of Soil Classification relevant to field crop production in Western Canada are reviewed.

Rationale

This is a required course for Crop Technology. An understanding of soil as a growth medium is essential to any form of crop production. Potential productivity can only be assessed through an awareness of the physical and chemical make-up of the soil, and the limitations of the soil for the crops or management intended. The wide variability of soil types, where they are located, and the potential differences in agricultural productivity are reviewed. Anyone interested in a basic understanding of soils would benefit from this course.

Prerequisites

None

Co-Requisites

None

Course Learning Outcomes

Upon successful completion of this course, students will be able to

1. define soil terms common to agronomy.
2. describe basic soil properties like texture, structure, colour, pH, organic matter and soil moisture.
3. use the Canadian System of Soil Classification at the Order and Great Group level for the common agricultural soils found in Western Canada.
4. locate land by legal description.
5. interpret Canada Land Inventory soil capability for agriculture maps.

6. describe the variability of soils and the effect soil type has on agricultural productivity.

Resource Materials

Brady, N. C., & Weil, R. R. (2010). *Elements of the nature and properties of soils* (3rd ed.).

Upper Saddle River, New Jersey: Prentice Hall.

Soil Classification Working Group. (1998). *The Canadian system of soil classification*. (3rd ed.). Ottawa, ON: Agriculture and Agrifood Canada.

Conduct of Course

The course consists of approximately 56 hours of lecture and 14 hours of lab work or lab-related study.

Classroom instruction is delivered in a lecture style with use of overheads and power point presentations. Student questions and discussion are expected during the lectures, as this is the best time to make sure the material is understood. Instructor questions relating to the topic under study are asked of students during lectures in order to determine the level of student's understanding and to reinforce concepts being taught.

Evaluation Procedures

Quizzes	30%
Labs	25%
Assignments	20%
Comprehensive Final	<u>25%</u>
Total	100%

Grade Equivalents and Course Pass Requirements

A minimum grade of D (50%) (1.00) is required to pass this course.

Letter	F	D	D+	C-	C	C+	B-	B	B+	A-	A	A+
Percent Range	0-49	50-52	53-56	57-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-100
Points	0.00	1.00	1.30	1.70	2.00	2.30	2.70	3.00	3.30	3.70	4.00	4.00

Students must maintain a cumulative grade of C (GPA - Grade Point Average of 2.00) in order to qualify to graduate.

Attendance

Classroom and laboratory attendance is considered vital to the learning process and as significant to the students' evaluation as examinations and reports.

- a. Students having a combination of excused and/or unexcused absence of 20 percent or higher for the scheduled course hours will be required to withdraw and will automatically receive a "RW" (required withdrawal) for the course, regardless of any other evaluation results. (RW is a failing grade.)
- b. An excused absence is one that is verified with your Instructor. Verification should be prior to the absence or the next class day following the absence. Verification of the absence may take the form of a note from your doctor/College nurse regarding illness, or a note from another Instructor regarding a field trip or other activity, or authorization by your Instructor. An unexcused absence is anything NOT verified by the instructor prior to the absence or the next class day following the absence.

NOTE: Any exceptions to the above attendance policy (e.g. timetable conflicts, work-related issues) must be approved in writing by the Department Chair prior to the beginning of the course.

It is the students' responsibility to know their own absentee record.

Normal hours are 8:30 a.m. to 6:30 p.m., with potential for evening courses, exams or extended field trips. Students are expected to be available for classes during these times.

Course Units/Topics

Major Topics - order of delivery may vary

1. Introduction
 - concept of soil
 - components that make up soil
 - soil horizons and profiles
2. Formation of Soil
 - soil forming factors
 - types of parent material
3. Physical properties of soil
 - soil texture
 - soil structure
 - soil color
 - soil density and porosity
4. Soil Classification
 - soil zones of the prairie provinces
 - Soil Orders typically used for cultivation of field crops on the prairies

5. Soil water
 - water holding capacity of soil
 - water movement in soil
6. Soil Temperature and Aeration
 - impact of soil aeration
 - impact of soil temperture
 - thermal properties of soils
 - impact of soil aeration
 - factors affecting soil aeration
7. Soil Colloids
 - clays
 - organic matter
 - soil cation exchange capacity
7. Soil Chemistry Properties
 - acidity
 - salinity
8. Soil Erosion
 - water erosion
 - wind erosion
 - erosion prevention
9. Soil Organisms and Ecology

Lab topics:

1. Soil texture and color
2. Soil structure
3. Soil density and porosity
4. Soil moisture
5. Soil pH and salinity
6. Soil mapping



Copyright©LAKELAND COLLEGE
2602 - 59 Avenue, Lloydminster, Alberta, Canada T9V 3N7. Ph: 780.871. 5700
5707 College Drive, Vermilion, Alberta, Canada T9X 1K5. Ph: 780.853.8400
Toll-free in Canada: 1 800 661 6490 Email: admissions@lakelandcollege.ca