

**CR 160**

**Plant Science and Field Crops**

**3 Credits**

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## CR 160 Version: 6



### Plant Science and Field Crops

#### Calendar Description

This course introduces the student to basic plant botany and the production of grain and oilseed crops in Western Canada. The student studies plant physiology, the major plant parts and their role in plant growth and development. The students discover what the major growth factors are for crops on the prairies and how they can affect these crops. They combine this with specific best practices for the major grain and oilseed crops of Western Canada.

#### Rationale

This is a required course for Agribusiness and Crop Technology students. Students working with field crops, forage crops, and/or weeds must understand how plants develop and the factors that affect this development. They should also know how to recognize plant features and structures so that they can identify plants in the field. Cash crops are a major source of revenue for prairie producers. It is also, therefore, crucial that anybody associated with the production of grain or oilseed crops understand the factors that affect the growth, development, and harvest quality of these crops.

#### Prerequisites

None

#### Co-Requisites

None

#### Course Learning Outcomes

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

#### Section #1 General Plant Biology

1. describe agronomy in historical terms, its influence on current practices, and its importance to sustain a growing world population.
2. memorize botany vocabulary, describe plant structures, and identify key developmental plant growth stages.

3. classify and differentiate between plant types by identifying their differences.
4. summarize the processes of photosynthesis and respiration, distinguish their differences and discuss how they influence crop yield.
5. define carbohydrate assimilation and recognize factors that affect where and when carbohydrates are stored.
6. develop writing and critical-thinking skills through online discussion groups.

## **Section #2 Crop Production**

1. describe and identify the differences in crop characteristics between canola, field peas, wheat, barley and oats.
2. describe environmental, genetic, and management factors that affect yield and quality of the major oilseed, pulse, and cereal crops.
3. predict plant physiological changes regarding plant density, seeding depth, and fertilizer placement.
4. discuss the differences between yield potential and yield; describe environmental factors that affect yield potential and the management factors used to increase it.
5. identify commonly grown crops by seed, juvenile and mature plants, from live, dried, and pressed samples.
6. develop writing and critical-thinking skills through online discussion groups.

## **Labs**

1. identify and recall what various crop plants look like from seeds and vegetative material
2. identify seed and plant physiology, as well as plant growth stages.
3. distinguish between dicot and monocot morphology.
4. calculate germination rates based on thousand seed weights and examine conditions that affect germination.
5. discover the effects temperature and seeding depth has on the emergence rate of various crops.

## **Resource Materials**

### ***Required Text:***

None

### ***Reference Text:***

Budd, A. C. (1979). *Budd's flora of the Canadian prairie provinces*. Agriculture Canada, Publication 1662.

Miscellaneous Alberta Agriculture publications as provided.

## Conduct of Course

The lecture portion (approx. 42 hours) of this course relies heavily on PowerPoint presentations, utilizing Kahoot! and classroom discussion where appropriate. The lab portion (14 hours) consists of lab exercises designed to provide the student with opportunities to demonstrate knowledge of plant structure, physiology, seedling development, and the identification of common crop species and types.

## Evaluation Procedures

The final grade is an aggregate of the following components:

Online D2L Discussions	6	30%
Reflections (pass/fail)	5	5%
Lab Exams (1 crop ID exam and 1 plant part ID exam)	2	15%
Midterm Exam	1	25%
Final Exam non comprehensive	1	25%
Total		100%

Late assignments are reviewed and comments made, but are assessed a grade of zero (0).

You must obtain a mark of 50% in the laboratory section, and at minimum, a 50% overall mark to pass this course.

Lakeland College is committed to the highest academic standards. Students are expected to be familiar with Lakeland College policies related to academic conduct and academic honesty and to abide by these policies. Violations of these policies are considered to be serious and may result in suspension or expulsion from the College.

## 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

Lesson #	Topics
INTRO	Course syllabus and expectations
1	Organization of the plant body
2	Cell organelles
3	Plant tissue and organs
4	Meristems, growth and differentiation
5	Root and stem development
6	Photosynthesis
7	Respiration
8	Roots and nutrient uptake
9	Transport of water and nutrients in plants
10	Distinguishing characteristics of dicots and monocots
11	General leaf arrangements and plant morphology
12	Plant Life cycles
13	Plant reproduction and seed development

14	Hormones and plant development
15	Dormancy and Germination
16	Plant physiology
17	Environmental effects on yield determination
18	Seedling emergence factors and seeding rate calculations
19	Seed Placement, timing and temperature effects
20	Introduction to canola
21	Canola characteristics and production practices
22	Wheat Introduction and classification system
23	Spring Wheat characteristics and production practices
24	Winter wheat characteristics and production practices
25	Barley introduction
26	Feed Malt and silage barley characteristics and production practices
27	Other cereals introduction (Oats, Rye, and Triticale)
28	Other cereals characteristics and production practices
29	Field peas introduction
30	Field peas characteristics and production practices

The above topics are subject to change based on circumstances that are reasonably beyond the instructor's control.



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