

CR245

Insects and Diseases of Crops

3 Credits

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CR245 Version: 5



Insects and Diseases of Crops

Calendar Description

This course is the study of crop pests, their identification, life cycles, effects on crops, and cultural, biological and chemical methods of management.

Rationale

This is a required course for the Crop Technology students. Successful crop production depends heavily on the success of the pest management program. Insect and disease management are particularly demanding because of the great variety of ways pathogens and insects can damage crops, and because of their many defense mechanisms.

Prerequisites

None

Co-Requisites

None

Course Learning Outcomes

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

1. identify the major disease pests of Western Canada, their damage, and their causal agents.
2. describe common life cycles of disease organisms using examples from prairie agriculture.
3. recognize and describe common disease symptoms.
4. describe and explain the concept of economic threshold levels.
5. describe and explain disease ecology and integrated disease management.
6. describe the structures and life systems in insects and how they affect the management of the insect pest.
7. identify the stages in the various life cycles.
8. identify the major insect pests of Western Canada and their damage.
9. describe chemical, cultural and biological control measures and the factors affecting these controls.

Resource Materials

Required Text(s):

Bailey, K. L., Gossen, B. D., Gugel, R. K., Morrall, R. A. A. . *Diseases of field crops in Canada: An illustrated compendium* (latest ed.). Harrow, ON: Canadian Phytopathological Society.

Brook, Harry. *Crop protection* (latest ed.). Edmonton, AB: Soil and Crop Management Branch, Alberta Agriculture. (This is an annual publication: The current version will be used). Agdex 606-1 Provided Free of Charge to students.

Philip, H., Svendsen, E., Olfert, O., *Field crop and forage pests and their natural enemies in western Canada*. 2017. Lakeland College press.

CR 245 *Insects and diseases of Crops*. Course Pak. 2018. Lakeland College Press.

Hand lens recommended.

Reference Text(s):

There are several excellent reference sources available from the Library, various government offices, and the industry.

Philip, H. *Insects of Alberta*. (Agdex 612-1). Edmonton, AB: Alberta Agriculture.

Mengersen, E., & Philip H. (1986). *Field crop insect pests of Alberta, Crop protection ' 86*. Edmonton, AB: Alberta Agriculture.

Harris, J. L. *Grasshopper control*. Regina, SK: Saskatchewan Agriculture.

Borror, D. J., DeLong, D. M., & Triplehorn, C. A. (1976). *An introduction to the study of insects* (4th ed.). New York: Holt, Rinehart and Winston.

Atkins, M. D. (1978). *Insects in perspective*. New York: MacMillan.

Chapman, R. F. (1971). *The insect's structure and function* (2nd ed.). New York: Elsevier.

Conduct of Course

The course is 70 hours of lectures, discussions and formal labs. Although all the course objectives are covered in the lecture material, it is expected that you read the recommended resource materials to help in your comprehension of the lessons. Field trips will be organized as the season and lecture schedule permits.

Questions are expected during the lectures and labs regarding the material, as this is the best time to ask them. This also means that you are reading your daily notes over at the end of each day to prepare questions for the next day. The instructor asks questions of you during the lesson.

Students can contact the instructor outside of regular class time for help. Please arrange an appointment.

Evaluation Procedures

The final grade is an aggregate of the following components:

Assignments - 2 @ 10%	20%
Lab ID Final Exams - 2 @ 10%	20%
Lab ID Quizzes 2 @ 5%	10%
Quizzes - 2 @ 5%	10%
Insect Final Exam	20%
Disease Final Exam	20%
TOTAL	100%

Late assignments are marked, but a grade of zero (0) is assessed.

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

1. Insect Structure and Physiology
 - body parts and functions
 - insect nervous system
 - digestive system
 - respiratory system
 - circulatory system
 - locomotion
2. Life Cycles and Reproduction
 - sexual reproduction
 - asexual reproduction
 - metamorphosis (complete, gradual/incomplete, ametabolous)

3. Taxonomy and Insect/Damage I.D.
 - nine major orders (characteristics)
 - identification (insect and damage)
4. Insect Management
 - prevention
 - insecticides - groups and mode of action
 - cultural control - rotations/stubble management
 - biological control - advantages/limitations
 - integrated pest management
 - environmental safety
5. Plant Diseases and Agriculture
6. Development of Plant Disease
 - what is a plant disease
 - plant disease triangle
 - disease cycle
 - environmental effects
7. Causes of Plant Diseases
 - biotic factors
 - abiotic factors
8. Diseases of Forages and Field Crops
9. Management of Plant Diseases
 - economic thresholds
 - integrated pest management
 - disease management categories
 - fungicides – groups and mode of action



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