

Course Philosophy

Students' Learning Responsibilities

Students are responsible for attending classes as well as laboratory sessions, and are responsible for information presented during those sessions. Handouts provided to students during class also contain information on which students may be tested.

Why this course is useful?

Plant diseases limit crop production. This course provides information on the micro-organisms and environmental factors causing diseases of field crops. Students will learn to identify plant disease, determine the cause of the disease and discuss suitable control methods.

Who should take this course?

Those students who require an understanding of plant health associated with disease as it relates to crop production are encouraged to take the course. This course would be a benefit to those choosing a career in agronomy or horticulture.

How this course fits into the curriculum

Ecology: Approved Option List

Course Description/Objectives

Undergraduate Calendar Description

Diseases attacking field crops and horticultural plants: recognition of symptoms, methods of prevention, alleviation, and control.

Instructional Methods

Classes are based on lectures sessions. Students will benefit from hands-on experience in laboratory sessions identifying diseases on plant specimens, inoculation of plant hosts and laboratory experience with micro-organisms causing disease.

Course Objectives

- 1) Understand the importance of plant disease in crop production.
- 2) Identify major diseases of field crops in Canada.
- 3) Understand biological, cultural, and chemical methods of disease control.
- 4) Understand the lifecycles and biological characteristics of pathogens associated with plant disease.

Learning outcomes

- 1) Students should have a technical understanding of disease impacts on crop production and be able to implement management solutions for disease control in cropping systems.
- 2) Students should be able to effectively communicate their ideas and pathology concepts learned in class in a professional setting.

Course Policies

Missed Assignments

Will receive a zero grade

Missed Exams

Any student missing a midterm test will be assigned a grade of zero unless a doctor's certificate or a valid justification is received within one week of the test. Students who cannot write a test for non-emergency reasons must get permission from the instructor, prior to the test. In any case, the final exam will be on 45% plus the value of the missed test. Students who miss the examination without a valid reason will receive a grade of zero (0) for the midterm examination.

Laboratory attendance is mandatory (check rules on your lab outlines). A passing laboratory grade (50% or higher) is required in order to pass the course.

Evaluative feedback on the term test will be given prior to the voluntary withdrawal deadline.

In the case of a missed final examination, a student will be assigned an F no paper grade for the course unless an acceptable medical certificate or a confirmable compassionate reason is provided in which case a supplementary examination will be allowed.

Academic Integrity

Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic penalty. Cheating in examinations or tests may take the form of copying from another student or bringing unauthorized materials into the exam room. Exam cheating can also include exam impersonation. A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty. Students should acquaint themselves with the University's policy on plagiarism, cheating, exam impersonation and duplicate submission (see Section 8, in the University of Manitoba Undergraduate Calendar 11/12).

Additional Comments:

Please be courteous and refrain from using cell phones during class.

Use of Third Party Detection and Submission Tools

Electronic detection tools may be used to screen assignments in cases of suspected plagiarism.

Group Work Policies:

Assignments for class and laboratories are to be conducted on an individual basis unless otherwise indicated.

Course Content

Course outline:

Introduction to Plant Diseases

- Importance of plant diseases
- Concept of disease
- Terminology

Causes of Plant Disease

Principles of Disease Control

Specific diseases of field crops

Fungal Plant Pathogens

- **Biology and classification of fungi**
- **Diseases caused by Oomycetes**
 - Late blight of potato and its epidemiology
 - White rust of turnip rape and mustard
 - Pythium root rot
- **Diseases caused by Ascomycetes**
 - Powdery mildew
 - Tan spot of wheat
 - Net blotch of barley
 - Septoria leaf and glume blotch of wheat
 - Ergot of cereals and grasses
 - Fusarium head blight of wheat and barley
 - Sclerotinia wilt
 - Blackleg of rapeseed
 - Dutch Elm disease
- **Diseases caused by Basidiomycetes**
 - Stem rust of cereals and epidemiology
 - Leaf rust of cereals
 - Sunflower rust; flax rust
 - Loose and covered smut of cereals; corn smut
- **Diseases caused by *Fungi imperfecti***
 - Verticillium wilt
 - Alternaria* spp.
 - Rhizoctonia* spp. (seedling blight and root rots)

Bacterial Plant Pathogens

- Bacterial blights and leaf spots
- Fire blight
- Soft rot and blackleg of potatoes

Resistance to Plant Diseases

- **Concepts of host-pathogen interactions**
- **gene-for-gene model**
- **toxin model**
- **Breeding for disease resistance**

Epidemiology of Plant Diseases:

- Disease measurement
- Concepts of plant disease epidemiology

Viral Diseases of Plants (time permitting)

- Plant viruses; nature and transmission
- Barley Yellow dwarf
- Stripe mosaic

Biological Control of Plant Diseases

Integrated Pest Management (IPM)