



**University of Manitoba**  
**Faculty of Agriculture and Food Science** \_\_\_\_\_  
**Department of \_\_ Plant Science** \_\_\_\_\_

**PLNT 4270**  
**PLANT DISEASE CONTROL**

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**COURSE DETAILS**

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**Course Title & Number:** Plant Disease Control- PLNT 4270  
**CRN:** 10933  
**Number of Credit Hours:** 03

**Class Times & Days of Week:** Class- Monday, Wednesday, Friday 1.30 pm to 2.20 pm  
Lab-Tuesday 11.30 am to 12.45 pm  
Sep.9, 2020–Dec. 15, 2020

**Location for classes/labs/tutorials:** Teaching online by Webex

**Teaching Assistant:** James De Castro

**TA Email:** [decastr4@myumanitoba.ca](mailto:decastr4@myumanitoba.ca)

**Pre-Requisites:** PLNT2500 (Or 039.250) or Consent of instructor

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**Instructor Contact Information**

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**Instructor(s) Name:** Dr. Zhongwei Zou, Research Associate

**Preferred Form of Address:** Zou

**Office Location:** Rm326, Plant Science

**Office Hours or Availability:** Monday to Friday 8:30-4:30 -By appointment only via email.

**Office Phone No:** 204-474-6563 (Lab)

**Email:** [Zhongwei.Zou@umanitoba.ca](mailto:Zhongwei.Zou@umanitoba.ca)

**Contact:** You can E-mail me regarding any questions about the course.

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**Course Description**

Diseases affecting Canadian field crops. General principles of plant pathology, recognition of symptoms, disease management, and pesticide use safety as they relate to plant disease control. Discussion of diseases attacking field and horticultural crops in the prairies including disease symptoms, disease cycles, prevention and control.

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**General Course Information**

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Plant diseases have a major impact on crop production and yield. The students will learn to diagnose, identify and learn technologies to manage most of the important plant diseases including more innovative and alternative methods. While the emphasis will be on management, the course will teach concepts in plant pathology, different types of plant pathogens, disease epidemiology, several methods of disease management and how they can be wisely used or integrated.

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**Course Goals**

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To understand, identify and master principles of disease management through the identification of reasons for disease occurrence, increase and their symptoms and interactions with the host.

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**Intended Learning Outcomes**

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Will be able to identify common diseases, and their management and effectively communicate the concepts learnt in a professional setting.

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**Using Copyrighted Material**

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Please respect copyright guidelines. For more information, see the University's Copyright Office website at <http://umanitoba.ca/copyright/> or contact [um\\_copyright@umanitoba.ca](mailto:um_copyright@umanitoba.ca).

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**Recording Class Lectures**

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Zhongwei Zou and the University of Manitoba hold copyright over the course materials, presentations and lectures which form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without permission of the instructor.

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**Textbook, Readings, Materials**

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1. Diseases of Field Crops 2003. Bailey, Gossen, Gugal, Morrall- (\$27.95 UofM book store) (Required)
2. Plant Pathology. 2005. 5<sup>th</sup> Edition. G.N. Agrios (Optional)
3. Diseases and pests of vegetable crops in Canada by Howard, Garland and Seaman (optional)
4. Any documentation from Manitoba Agriculture on crop recommendation for Manitoba
5. websites: <https://www.grainscanada.gc.ca/en> , <https://www.canolacouncil.org/> , <https://phytopath.ca/>, <https://phytopath.ca/publications/canadian-journal-of-plant-pathology->

[links-liens-de-la-revue-canadienne-de-phytopathologie/](#),  
<http://www.apsnet.org/Pages/default.aspx>,

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### Course Technology

Through lectures (power point presentations), labs, handouts, reading material and interactive class discussions. Due to Covid-19, the lecture will be delivered online through Webex, Bluejeans, or Zoom.

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### Class Communication

Please note that all communication between myself and you as a student must comply with the electronic communication with student policy ([http://umanitoba.ca/admin/governance/governing\\_documents/community/electronic\\_communication\\_with\\_students\\_policy.html](http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html)). You are required to obtain and use your U of M email account for all communication between yourself and the university.

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### Expectations/student responsibilities

- Attend all classes and labs.
- The students need read the relevant sections of required text, visit recommended websites
- Participate in class discussions.
- Ask questions during the class.
- Refrain from using the cell phone during the class.

### 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 University of Manitoba Undergraduate Calendar 20/21).

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### Students Accessibility Services

#### Student Accessibility Services

If you are a student with a disability, please contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

*Student Accessibility Services* <http://umanitoba.ca/student-supports/accessibility> ,  
520 University Centre  
204 474 7423  
[Student\\_accessibility@umanitoba.ca](mailto:Student_accessibility@umanitoba.ca)

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### **Expectations: You Can Expect Me To**

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- Provide you with all important class material-handouts.
- Discuss any questions about the course.
- Respond to your emails regarding the course.
- Give exam results on time.

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### **Schedule A: A list of academic supports available to students**

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<https://centre.cc.umanitoba.ca/wp-content/uploads/2020/07/Text-for-Schedule-A-ROASS-July-27-2020.pdf>

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### **Class Schedule**

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**I Class 1, 2, 3: Introduction to the course, to plant disease, importance of plant disease in cropping system.**

Why plant disease control?

Discussion of the course and what is expected of the students, symptoms, terminology, biotic and abiotic diseases, and common knowledge of plant disease.

**II Class 4, 5, 6, 7: General concepts of plant pathology; plant pathogens-Fungi, Bacterial, Viruses; plant-pathogen interaction.**

Types of plant disease, and Effects of plant disease on crop production and yield loss,  
Causal agents of plant disease: Fungi, Bacterial, Viruses,  
How pathogens attack plant and how plants defend against pathogens

**III Class 8, 9, 10: Environmental effects on plant disease development, genetics of plant disease, cropping systems and their effect on disease development.**

Understanding the disease triangle stories in HOST, PATHOGEON, and ENVIRONMENT

**IV Class 11, 12, 13: Diseases on sunflower, flax, potato**

Diseases of sunflower,

Diseases of flax,  
Diseases of potato (Guest lecturer)

## **Mid-term Exam I Presentations/Assignments (October)**

**V Class 14, 15, 16: Diseases caused by fungi, viruses, bacterial, nematodes**

**VI Class 17, 18, 19, 20: Diseases of canola**

Blackleg,  
Clubroot,  
Sclerotinia  
Verticillium stripe

**VII Class 21, 22, 23, 24: Diseases on cereals**

Fusarium head blight on wheat  
Stem rusts,  
Leaf rusts,  
Stripe rust,

## **Mid-term exam II Presentations/Assignments (November)**

Students will be given topics related to agricultural practices, issues, plant disease control methods. (The topics will be assigned two weeks advance for preparation).

Example of topics:

1. Are stubble-borne pathogens on the rise due to minimum-till and no-till farming system?
2. For most important cash crop canola in Canada, how to control blackleg disease through breeding/R gene rotation/biocontrol/fungicide using?

10 minutes presentation, 5 minutes question. Students will be working in groups to research the assigned topics.

**VIII 25, 26, 27: Diseases of Corn, soybean**

**IX 28, 29, 30: plant disease control**

Principles of plant disease control  
Fungicides application in disease control

Breeding for disease resistance

### **X 31: Epidemiology of plant disease**

Basic concepts in plant disease epidemiology

Disease forecasting and models

### **XI 32: Biological control**

### **XII Genomics and transcriptomics in understanding plant-pathogen interactions**

### **XIII New technology application in plant disease control and revision**

Population genetics of pathogens

CRISPR/RNAi

Revision

## **Final exam will be determined based on the performance of assignments and Min-terms.**

This schedule is subject to change at the discretion of the instructor and/or based on the learning needs of the students but such changes are subject to Section 2.8 of the – [ROASS](#)- Procedure.

### **Laboratory Expectations**

At the end of lab classes students are expected to develop skills to identify and diagnose common plant diseases in field crops.

### **Lab Schedule**

<b>Lab</b>	<b>Lab Content</b>	<b>Required Readings</b>	<b>Evaluation</b>
1	Plant diseases illustration	-	Assignment
2	Canola pathogenicity test: cotyledon inoculation test, adult plant inoculation in GH, Field. Rating methods.	Lab lecture	Assignment
3	Canola clubroot Sclerotinia stem rot,	Lab lecture	Assignment



	Verticillium stripe, pathogenicity assessment.		
4	Chemical Control	Lab lecture	Assignment
5	TBA	Lab lecture	Assignment
6	Wheat FHB disease inoculation and rating.	Lab lecture	Assignment
7	Biological control (fungi and bacteria)	Lab lecture	Assignment
8	Wheat leaf/stem/ rust/stripe rust diseases assessment	Lab lecture	Assignment
9	Soybean Phytophthora root and stem rot, SCN, SDS, etc.	Lab lecture	Assignment
10	Potato late blight	Lab lecture	Assignment
11	Corn Goss's bacterial wilt, Fusarium ear rot, etc.	Lab lecture	Assignment
12	Revision		

This schedule is subject to change at the discretion of the instructor and/or based on the learning needs of the students but such changes are subject to Section 2.8 of the – [ROASS-Procedure](#).

### Course Evaluation Methods

Due Date:	Assessment Tool	Value of Final Grade
TBA	Mid-Term Exam-I/assignments	25%
TBA	Mid-Term Exam-II /assignments	25%
TBA	Lab Reports & assignments	20%
TBA	Final Exam	30%

### Grading

Letter Grade	Percentage out of 100	Grade Point Range	Final Grade Point
A+	90-100	4.25-4.5	4.5

A	80-89	3.75-4.24	4.0
B+	74-79	3.25-3.74	3.5
B	68-73	2.75-3.24	3.0
C+	62-67	2.25-2.74	2.5
C	56-61	2.0-2.24	2.0
D	50-55	Less than 2.0	1.0
F	Less than 50		0

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### Referencing Style

Assignments should use the Plant Pathology reference style.

[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1365-3059/homepage/ForAuthors.html](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1365-3059/homepage/ForAuthors.html)

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### Assignment Description

Students will need to submit lab reports. Each lab Report should include a title, objectives, materials and methods, results and discussion.

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### Assignment Grading Times

You will receive your graded exam papers three days after the exam. You will receive your graded lab assignments one week after the date of submission.

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### Assignment Extension and Late Submission Policy

Lab assignments are due after one week to be handed over to the TA on the day of the next lab. **Late Assignments-** will receive 5% less for each day being late and after one week (being late) a 0% will be assigned to the assignment if there was no valid reason (by e-mailing the instructor and TA concerned) for the delay. **Missed Assignments-** A grade of 0 (zero) will be assigned to any student who misses a lab or does not hand over the lab assignment on time without a valid reason or a doctor's medical certificate. **Missed Exams -**A grade of 0 (zero) will be assigned to any student who misses an exam without a valid reason or without the consent of the instructor. No rescheduling of an examination will be allowed, regardless of the circumstances. Those who miss the examination (with a valid reason.i.e. medical certificate) will have to retake the exam (a whole new exam).

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### Voluntary withdrawal deadline

The voluntary withdrawal deadline is on 23rd November 2020. Students will receive marks of midterm I and Presentation (35% of final grade) before deadline.

**Evaluative feedback will be provided to the students prior to the withdrawal date.**