



**University of Manitoba
Faculty of Agricultural and Food Sciences
Department of Plant Science**

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COURSE DETAILS

Course Title & Number:	PLNT4570 - Research Methods in Plant Pathology
Number of Credit Hours:	3
Class Times & Days of Week:	TR: 8:30am – 9:45am
Location for classes/labs/tutorials:	Rooms 343, 018, 009 Agriculture Bldg.
Pre-Requisites:	One course in plant pathology or consent of instructor.

Instructor Contact Information

Instructor(s) Name:	Dr. Fouad Daayf / Ms. Pawanpuneet Rehal
Preferred Form of Address:	
Office Location:	--- Agriculture Bldg.
Office Hours or Availability:	Tue 9:30am – 12pm
Office Phone No.	204-474-6096
Email:	Fouad.Daayf@umanitoba.ca
Contact:	Students may contact the instructor by email.

Course Description

Course will provide practical training in plant pathology and will cover plant disease diagnosis, pathogen isolation, identification, inoculation, and storage. Selected molecular techniques used in the study of plant pathogens will be covered. The laboratory component aims at preparing students for a professional career in plant protection and research in plant pathology.

Prerequisite: PLNT 3570 (or 039.357) or consent of instructor.

General Course Information

This course will provide students with an overview of the methods used in plant pathology studies. This includes an array of techniques, from the most classical, such as the Koh's postulate to more advanced techniques such as those assessing changes in gene expression of either the host or the pathogen.

This course will be especially useful to students interested in further specialization in plant pathology, but will also prepare them if they need to apply their knowledge in a new position.

Course Goals

This course will provide students with practical training in plant pathology, including:

- Learning the steps to plant disease diagnosis,
- Learning how to isolate pathogens, identify them, and store them,
- Learning how to make artificial inoculations,
- Getting initiated to some of the current molecular techniques used in the study of plant pathogens and their interaction with their hosts,
- Having a practical demonstration of host-pathogen concepts

Intended Learning Outcomes

Students taking this course will be initiated to a diverse array of methods used in plant pathology including both classical and more advanced molecular methods. This will prepare them for a variety of professional careers, including in plant protection with the industry, and in plant pathology research if they take the option to do graduate studies in plant pathology.

Using Copyrighted Material

Please respect copyright. We will use copyrighted content in this course. I have ensured that the content I use is appropriately acknowledged and is copied in accordance with copyright laws and University guidelines. Copyrighted works, including those created by me, are made available for private study and research and must not be distributed in any format without permission. Do not upload copyrighted works to a learning management system (such as UM Learn), or any website, unless an exception to the *Copyright Act* applies or written permission has been confirmed. For more information, see the University's Copyright Office website at <http://umanitoba.ca/copyright/> or contact um_copyright@umanitoba.ca.

Recording Class Lectures

Dr. Fouad Daayf holds 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 from Dr. Fouad Daayf. Course materials (both paper and digital) are for the participant's private study and research.

Textbook, Readings, Materials

No textbook is required for this course. Suggested readings include:

1. Plant Pathology: concepts and laboratory exercises. R.N. Trigiano, M.T. Windham and A.S. Windham, CRC Press 2003
2. Plant Pathology, 5th Edition. G. Agrios. Academic Press, San Diego, CA. 2005.
3. Methods for evaluating plant fungicides, nematocides and bactericides. The American Phytopathological Society (1978)
4. Seed Treatment by K.A. Jeffs, British Crop Protection Council, 1986
5. Soilborne plant pathogens by G.W. Bruehl 1986, MacMillan Publishing Company (New York)
6. Laboratory guide for identification of plant pathogenic bacteria. N.W. Shaad. APS Press, St. Paul, MN, 1980

Course Technology

All technology resources are to be used in a responsible, efficient, ethical and legal manner. The student can use all technology in classroom setting only for educational purposes approved by instructor and/or the University of Manitoba Disability Services.

Student should not participate in personal direct electronic messaging / posting activities (e-mail, texting, video or voice chat, wikis, blogs, social networking (e.g. Facebook) online and offline "gaming" during scheduled class time.

If student is on call (emergency) the student should switch his/her cell phone on vibrate mode and leave the classroom before using it.

Class Communication

The University requires all students to activate an official University email account. For full details of the Electronic Communication with Students please visit:

https://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html

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). You are required to obtain and use your U of M email account for all communication between yourself and the university.

Expectations: I Expect You To

Students will attend lectures and laboratory sessions presented by the instructors. Throughout the term, students will be required to attend the lectures (online) and laboratory sessions (either online or in person, where necessary) and provide project reports as directed. They will also have to prepare and present two papers as specified by the instructor or chosen by the student. Each student will need to record his/her course activities as “Laboratory Notes”, which will be graded by the instructor towards the end of the course.

I will treat you with respect and would appreciate the same courtesy in return as well as towards your classmates. See [Respectful Work and Learning Environment Policy](#).

Academic Integrity:

In addition to the general information about academic integrity and student discipline that you will find in Schedule “A” Policies and Resources, the following specific course requirements apply for both individual and group work:

- (i) Projects are subject to the rules of academic dishonesty;
- (ii) Consultation with classmates for projects and assignments must adhere to the principles of academic integrity; and
- (iii) All work is to be completed independently unless otherwise specified.

Make clear your expectations as it pertains to academic integrity within the context of your course and refer specifically to the course requirements.

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

Expectations: You Can Expect Me To

In this course, the instructor and invited speakers will give lectures on specific topics. However, most of the course is run in a research laboratory setting (due to Covid-19, special arrangements have been made to have in-person activities, where necessary). The course is made of several topics. Each topic will be explained by an instructor, and the corresponding laboratory component done by the students, with the help and advice of an instructor. Where physical presence is not necessary, information, including videos, will be shared with the students. Each student will have an opportunity to run experiments related to each of the covered topics using materials and equipment in a plant pathology research laboratory, such as PCR thermocyclers, HPLC, and gel documentation systems.

Class Schedule

Disclaimer: 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.

The following topics will be covered through lectures, lab case studies, and discussions on:

- Basic concepts in plant pathology
- Pathogen isolation, culturing and storage
- Soil-borne pathogens
- Foliar pathogens
- Obligate parasites
- Seed-borne pathogens
- Molecular approaches in plant pathology
- Disease quantification
- Fungicide resistance

Missed Exams

Missed exams will be given a nil mark unless a valid justification is presented.

Important Dates (e.g., voluntary withdrawal date)

For voluntary withdrawal deadline, see the calendar. As required by the University, evaluative feedback will be provided by the voluntary withdrawal deadline.

Use of Third Party Detection and Submission Tools

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

Laboratory Expectations

- Students are expected to attend all laboratory sessions, either in person or online, as requested by the instructors.

- The Teaching Assistant will treat you with respect and will appreciate the same courtesy in return.

Lab Schedule

Laboratory case studies may include:

- Aseptic techniques, media preparation, culturing of bacteria and fungi
- Soil-borne pathogens: Isolation, inoculum preparation, inoculation and disease evaluation
- Foliar pathogens: Isolation, identification, inoculum preparation, inoculation and disease assessment
- Infection process: observation of infection structures
- Detection of pathogens using PCR
- Disease assessment: training in visual and computer-assisted plant disease quantification (image analysis)
- pathogen's dose-response to fungicides
- Chromatography and/or molecular analysis of plant responses to diseases

Course Evaluation Methods

The students' learning will be assessed using a variety of methods, including exams, quizzes, a term paper, lab tests and assignments, and participation in class discussions.

Date:	Assessment Tool	Value of Final Grade
TBA	Project Report #1	15%
TBA	Project Report #2	15%
TBA	Paper Presentation	15%
TBA	Project Presentation	15%
Throughout	Lab Book	15%
TBA	Final exam	25%
Total		100%

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+	75-79	3.25-3.74	3.5
B	70-74	2.75-3.24	3.0
C+	65-69	2.25-2.74	2.5
C	60-64	2.0-2.24	2.0
D	50-59	Less than 2.0	1.0

F	Less than 50		0
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Referencing Style

Please use one of the following referencing styles: Harvard, APA, or Vancouver.

Assignment Descriptions

The students will have two assignments, which will be described in detail in the lab.

Assignment Grading Times

Note that the grading of the project reports will not be done before the voluntary withdrawal date.

Assignment Extension and Late Submission Policy

Late Assignments

Assignments that are submitted after the stated deadline will be deducted 5% a day of the grade up to the end of the first week and 25% thereafter for each week the assignment is late.

Missed Assignments

Missed assignments will be given a nil mark unless a valid justification is presented. Assignments, reports, or exams which are illegible or poorly written may be subject to refusal or deduction of the final grade.

Schedule “A”

Section (a)

Writing and Learning Support

The Academic Learning Centre (ALC) offers services that may be helpful to you throughout your academic program. Through the ALC, you can meet with a learning specialist to discuss concerns such as time management, learning strategies, and test-taking strategies. The ALC also offers peer supported study groups called Supplemental Instruction (SI) for certain courses that students have typically found difficult. In these study groups, students have opportunities to ask questions, compare notes, discuss content, solve practice problems, and develop new study strategies in a group-learning format.

You can also meet one-to-one with a writing tutor who can give you feedback at any stage of the writing process, whether you are just beginning to work on a written assignment or already have a draft. If you are interested in meeting with a writing tutor, reserve your appointment two to three days in advance of the time you would like to meet. Also, plan to meet with a writing tutor a few days before your paper is due so that you have time to work with the tutor's feedback.

These Academic Learning Centre services are free for U of M students. For more information, please visit the Academic Learning Centre website at:

<http://umanitoba.ca/student/academiclearning/>

You can also contact the Academic Learning Centre by calling 204-480-1481 or by visiting 201 Tier Building.

University of Manitoba Libraries (UML)

As the primary contact for all research needs, your liaison librarian can play a vital role when completing academic papers and assignments. Liaisons can answer questions about managing citations, or locating appropriate resources, and will address any other concerns you may have, regarding the research process. Liaisons can be contacted by email or phone, and are also available to meet with you in-person. A complete list of liaison librarians can be found by subject: <http://bit.ly/WcEbA1> or name: <http://bit.ly/1tJ0bB4>. In addition, general library assistance is provided in person at 19 University Libraries, located on both the Fort Garry and Bannatyne campuses, as well as in many Winnipeg hospitals. For a listing of all libraries, please consult the following: <http://bit.ly/1sXe6RA>. When working remotely, students can also receive help online, via the Ask-a-Librarian chat found on the Libraries' homepage: www.umanitoba.ca/libraries.

Section (b)

For 24/7 mental health support, contact the Mobile Crisis Service at 204-940-1781.

Student Counselling Centre

Contact SCC if you are concerned about any aspect of your mental health, including anxiety, stress, or depression, or for help with relationships or other life concerns. SCC offers crisis services as well as individual, couple, and group counselling. *Student Counselling Centre:*

<http://umanitoba.ca/student/counselling/index.html>

474 University Centre or S207 Medical Services

(204) 474-8592

Student Support Case Management

Contact the Student Support Case Management team if you are concerned about yourself or another student and don't know where to turn. SSCM helps connect students with on and off campus resources, provides safety planning, and offers other supports, including consultation, educational workshops, and referral to the STATIS threat assessment team.

Student Support Intake Assistant <http://umanitoba.ca/student/case-manager/index.html>

520 University Centre

(204) 474-7423

University Health Service

Contact UHS for any medical concerns, including mental health problems. UHS offers a full range of medical services to students, including psychiatric consultation.

University Health Service <http://umanitoba.ca/student/health/>

104 University Centre, Fort Garry Campus

(204) 474-8411 (Business hours or after hours/urgent calls)

Health and Wellness

Contact our Health and Wellness Educator if you are interested in information on a broad range of health topics, including physical and mental health concerns, alcohol and substance use harms, and sexual assault.

Health and Wellness Educator

<https://umanitoba.ca/student/health-wellness/welcome-about.html>

Katie.Kutryk@umanitoba.ca

469 University Centre

(204) 295-9032

Live Well @ UofM

For comprehensive information about the full range of health and wellness resources available on campus, visit the Live Well @ UofM site:

<http://umanitoba.ca/student/livewell/index.html>

Section (c) sample: re: A notice with respect to copyright:

All students are required to respect copyright as per Canada's *Copyright Act*. Staff and students play a key role in the University's copyright compliance as we balance user rights for educational purposes with the rights of content creators from around the world. The Copyright Office provides copyright resources and support for all members of the University of Manitoba community. Visit <http://umanitoba.ca/copyright> for more information.

Section (d)

Your rights and responsibilities

As a student of the University of Manitoba you have rights and responsibilities. It is important for you to know what you can expect from the University as a student and to understand what the University expects from you. Become familiar with the policies and procedures of the University and the regulations that are specific to your faculty, college or school.

The [Academic Calendar](http://umanitoba.ca/student/records/academiccalendar.html) <http://umanitoba.ca/student/records/academiccalendar.html> is one important source of information. View the sections *University Policies and Procedures* and *General Academic Regulations*.

While all of the information contained in these two sections is important, the following information is highlighted.

- If you have questions about your grades, talk to your instructor. There is a process for term work and final **grade appeals**. Note that you have the right to access your final examination scripts. See the Registrar's Office website for more information including appeal deadline dates and the appeal form <http://umanitoba.ca/registrar/>
- You are expected to view the General Academic Regulation section within the Academic Calendar and specifically read the **Academic Integrity** regulation. Consult the course syllabus or ask your instructor for additional information about demonstrating academic integrity in your academic work. Visit the Academic Integrity Site for tools and support <http://umanitoba.ca/academicintegrity/> View the **Student Academic Misconduct** procedure for more information.
- The University is committed to a respectful work and learning environment. You have the right to be treated with respect and you are expected to conduct yourself in an appropriate respectful manner. Policies governing behavior include the:

Respectful Work and Learning Environment

http://umanitoba.ca/admin/governance/governing_documents/community/230.html

Student Discipline

http://umanitoba.ca/admin/governance/governing_documents/students/student_discipline.html

Violent or Threatening Behaviour

http://umanitoba.ca/admin/governance/governing_documents/community/669.html

- If you experience **Sexual Assault** or know a member of the University community who has, it is important to know there is a policy that provides information about the supports available to those who disclose and outlines a process for reporting. The **Sexual Assault** policy may be found at:
http://umanitoba.ca/admin/governance/governing_documents/community/230.html
More information and resources can be found by reviewing the Sexual Assault site
<http://umanitoba.ca/student/sexual-assault/>
- For information about rights and responsibilities regarding **Intellectual Property** view the policy
https://umanitoba.ca/admin/governance/governing_documents/community/235.html

For information on regulations that are specific to your academic program, read the section in the Academic Calendar and on the respective faculty/college/school web site
<http://umanitoba.ca/faculties/>

Contact an **Academic Advisor** within our faculty/college or school for questions about your academic program and regulations <http://umanitoba.ca/academic-advisors/>

Student Advocacy

Contact Student Advocacy if you want to know more about your rights and responsibilities as a student, have questions about policies and procedures, and/or want support in dealing with academic or discipline concerns.

<http://umanitoba.ca/student/advocacy/>

520 University Centre

204 474 7423

student_advocacy@umanitoba.ca