

COURSE SYLLABUS

COURSE TITLE: INTRODUCTORY PLANT PATHOLOGY

COURSE CODE: Biol 345

COURSE CREDITS: 3.0

CLASS SECTION: 01

CLASS LOCATION: Biology RM 124

CLASS TIME: Tuesday and Thursday 10:00am - 11:20am

WEBSITE: via Course Tools (Blackboard)

TERM: 02

DELIVERY: Lecture & Practicum

START DATE: Jan 7th, 2020

LAB LOCATION: Biology RM 218

LAB TIME: Thursday 1:30pm - 5:20pm

Course Description

This course will deal primarily with broad concepts and principles of plant pathology, pathogen biology and diversity, contemporary topics related to plant-pathogen interactions, and plant disease management.

Prerequisites

Students are expected to be familiar with the principles and terminology of biology and with the morphology, anatomy, and physiology of plants. Prerequisite includes BIOL 222.3.

Learning Outcomes

Students who earn the Introductory Plant Pathology will have a basic understanding of plant diseases, their causes, effects and controls.

By the end of this course, students will be able to:

- understand the importance of plant diseases.
- define and understand the concepts of plant disease.
- carry out plant disease diagnosis.
- understand the mechanisms underlying plant disease resistance and pathogen virulence.
- understand interactions between plant diseases and environment.
- understand interactions between plant pathogens and environmental antagonists.
- apply integrative approaches in disease management.
- solve problems relating to the fundamental principles of plant pathology.

Evaluation

Lecture Midterm Exam (20 %)

Lecture Final Exam (40 %)

Lab reports/presentation (28 %)

Lab exam (12 %)

Midterm Exam

Date: See Course Schedule

Length: 80 minutes

Type: Invigilated exam

Description: The exam consists of term definition, short answer questions, and long essay questions

Final Exam

Date: TBA

Length: 3 hours

Type: Comprehensive and invigilated exam

Description: The exam consists of multiple choices, short answer questions, and long essay questions

Completion of the final lecture exam is required in order to pass this course.

Course Overview

This course consists of 80 minutes of lecture, two mornings per week, beginning on January 7, 2020. There will be a weekly, 3.5-hour lab session, beginning during the week of January 13-17, 2020.

Class Schedule

Lecture Modules

Chapter 1 Introduction

Chapter 2 Agents causing plant diseases

Chapter 3 Parasitism and disease development

Chapter 4 Pathogenesis

Lecture Midterm Exam (Feb. 13th, 2020)

Chapter 5 Host defence responses

Chapter 6 Genetics of plant disease

Chapter 7 Environmental effects and disease epidemics

Chapter 8 Control of plant diseases

- Plant quarantine

- Cultural control

- Chemical control

- Biological control

- Resistance breeding

- Integrated pest management

Lecture Final Exam (TBA)

Lab Practicum

DATE	Lab #	Topic
Jan 14	1	Introduction to plant diseases and pathogens: review samples of disease types and pathogen structures.
Jan 21	2	Media preparation, pathogen isolation and identification, using assorted diseased specimens. Bring diseased materials (look in your fridge!)
Jan 28	3	Inoculation techniques using a number of hosts and pathogens: powdery mildew, <i>Colletotrichum</i> and <i>Sclerotinia</i> pathosystems. Examine culture plates and transfer to make pure culture.
Feb 4	4	Fungal pathogenesis: examine infection processes and specificity of pathogens. Record and examine results of inoculations in lab 3. Extract DNA from pure culture. DNA will be used for PCR, sequencing and BLAST search
Feb 11	5	Start Koch's postulates – isolate <i>Mycosphaerella pinodes</i> from pea. Inoculate lentil residue with mating types of <i>C. truncatum</i> . Examine pulse diseases – <i>Ascochyta</i> on lentil and chickpea, mildew of peas, anthracnose of lentil.
Feb 17	MID –TERM BREAK	No lab
Feb 25	6	Koch's postulates – examine isolates and transfer to obtain pure culture of pathogen. Oilseed diseases – <i>Alternaria</i> , clubroot, <i>Sclerotinia</i> , <i>Leptosphaeria</i> , aster yellows.

Mar 3	7	Koch's postulates – inoculate pea plants with your isolates. Vegetable diseases – late blight of potato, aster yellows of carrot, <i>Fusarium</i> dry rot and other <i>Fusarium</i> species. Discuss results of molecular diagnosis.	
Mar 10	8	Koch's postulates – Examine plants for symptoms, re-isolate pathogen. Begin evaluation of microbial antagonism.	
Mar 17	9	Cereal diseases – look at smut, bunt, <i>Fusarium</i> head blight, leaf spots, ergot. Koch's postulates – verify isolate identity. Continue evaluation of microbial antagonism. Monitor development of sexual stage of <i>Colletotrichum</i> . Rusts on cereals and fruit. Other fruit diseases – apple scab, <i>Taphrina</i> .	
Mar	24	10	Review session/Final Lab Exam.

Midterm and Final Examination Scheduling

Midterm and final examinations must be written on the date scheduled.

Final examinations may be scheduled at any time during the examination period (April 6-30, 2020); students should therefore avoid making prior travel, employment, or other commitments for this period. If a student is unable to write an exam through no fault of his or her own for medical or other valid reasons, documentation must be provided and an opportunity to write the missed exam may be given. Students are encouraged to review all examination policies and procedures: <http://www.usask.ca/calendar/exams&grades/examregs/>

Instructor Information

Lecturer:

Dr. Yangdou Wei (CSRB, RM 220.4)

Tel: 306-966-4447

E-mail: yangdou.wei@usask.ca

Lab Coordinator:

Mr. James Bush (Biology building, RM 216)

Tel: 306-966-4423

E-mail: james.bush @usask.ca

Office Hours:

By appointment

Required Resources

Readings/Textbooks

Diseases of Field Crops in Canada (Bailey *et al.*, 2003)

Plant Pathology, 5th edition (Agrios, 2005)

Examinations with Disability Services for Students (DSS)

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Disability Services for Students (DSS) if they have not already done so. Students who suspect they may have disabilities should contact DSS for advice and referrals. In order to access DSS programs and supports, students must follow DSS policy and procedures. For more information, check <http://www.students.usask.ca/disability/>, or contact DSS at 306-966-7273 or dss@usask.ca.

Students registered with DSS may request alternative arrangements for mid-term and final examinations. Students must arrange such accommodations through DSS by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by DSS.

Absence at Examinations

Students absent from the Midterm or Laboratory Examination must contact the Course Coordinator or Lab Coordinator, respectively, *in person or by telephone, within three (3) working days of the date of the scheduled exam*, in order to explain their absence and to initiate discussion concerning a possible deferred examination. Such students must also provide the Coordinator with the necessary documentation explaining the student's absence at the examination. Otherwise, a grade of zero will be assigned for the missed examination.

Students absent from the Final Examination in April 2019 must contact the College in which they are enrolled, to apply for permission to write a Deferred Final Exam arranged to be written in mid-June 2019.

Integrity Defined (from the Office of the University Secretary)

The University of Saskatchewan is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Student Conduct & Appeals section of the University Secretary Website and avoid any behavior that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

It is a course requirement that all students read and be familiar with the Regulations on Academic Student Misconduct (http://www.usask.ca/university_secretary/honesty/StudentAcademicMisconduct.pdf) as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals (http://www.usask.ca/university_secretary/honesty/StudentNon-AcademicMisconduct2012.pdf)

For more information on what academic integrity means for students, see the Student Conduct & Appeals section of the University Secretary Website at:

http://www.usask.ca/university_secretary/pdf/dishonesty_info_sheet.pdf