

UM Syllabus

Pesticides: Environment, Economics, and Ethics (SOIL 3520)

Contents

COURSE DETAILS	2
COURSE DESCRIPTION.....	2
COURSE GOALS AND LEARNING OBJECTIVES	2
COURSE MATERIALS AND TECHNOLOGY	2
EXPECTATIONS AND POLICIES	3
LECTURE SCHEDULE.....	3
COURSE ASSESSMENT	4
GRADING	5
IMPORTANT DATES	5

COURSE DETAILS

Course Title: Pesticides: Environment, Economics and Ethics

Course Number: SOIL 3520

Academic Session: Winter 2024

Number of Credit Hours: 3

Class Times & Days of the Week: Mondays, Tuesdays, and Fridays from 9:30 am to 10:20 am.

Pre-Requisites: None

Instructor Name: Inoka Amarakoon (Inoka)

Office Hours or Availability: I am available for individual meetings. Email works best to schedule a meeting.

Office Phone Number: (204) 807-1167

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COURSE DESCRIPTION

U of M Course Calendar Description: A comprehensive examination of the benefits and risks of pesticide use. Topics include Characteristics of pesticide products and formulations used in Western Canada; History, practice, successes and failures in the use of pesticides in agriculture; Pesticide use for protecting human health; Pesticide fate processes in air, soil and aquatic environments; Economic and environmental impact of pesticide application drift; Atmospheric pesticide contamination; Pesticide surface and groundwater contamination; Pesticide toxicity to organisms, including humans; Pesticide residues in food; Pesticide regulations; Pesticide risk indicators; Alternatives to pesticides.

COURSE GOALS AND LEARNING OBJECTIVES

This course examines the benefits, risks, and challenges of pesticide use in agriculture. By the end of this course, students will be able to identify the Economic and environmental aspects of pest management, Develop skills in critical appraisal and communication of controversial scientific topics, and Relate the chemical properties of pesticides to their fates in the environment.

COURSE MATERIALS AND TECHNOLOGY

Lecture slides and reference material are posted on UMLearn. Class communications are posted on UMLearn and emailed, and the class is expected to check the UMLearn and University email accounts to stay up-to-date with class communications. There is no required textbook for this course, but recommended readings for the class are posted on UMLearn.

EXPECTATIONS AND POLICIES

- Regular attendance in lectures is expected from 9:30-10:20 on Mondays, Wednesdays, and Fridays to enable a structured and focused learning experience, active participation, a sense of accountability and responsibility, time management skills, and overall academic performance.
- Active engagement in learning and classroom activities is expected.
- The instructor encourages questions during the class, and questions via emails are answered within 24 hours of receiving them from Monday to Friday.
- It is expected to respect the University policy on respectful work and learning environments. <https://umanitoba.ca/governance/governing-documents/governing-documents-university-community#respectful-work-and-learning-environment-rwle>
- Governing Documents: University Community - [Governing Documents: University Community | Governance | University of Manitoba \(umanitoba.ca\)](#)
- Student Accessibility Services - [Accessibility for students | University of Manitoba \(umanitoba.ca\)](#)
- Recording of Classes: The instructor holds copyright over the course materials, presentations, and lectures that form part of this course. No audio or video recording of lectures or presentations is allowed in any format without the instructor's permission. Paper and digital course materials are for the participant's private study and research only.
- Academic Integrity: Plagiarism or any other form of cheating in examinations, term tests, or academic work is subject to serious academic penalties. Students should acquaint themselves with the University's policy on plagiarism, cheating, exam impersonation, and duplicate submission.

LECTURE SCHEDULE

Date	Lecture Topic
Jan 8 – 24 (8 Lectures)	Module 1: Introduction to Pesticide Introduction to Pesticides History and Development of Pesticide Use in Agriculture Benefits, Challenges, and Disasters of Pesticide Use. Rise and Demise of Dichlorodiphenyltrichloroethane (DDT) Development of Herbicide Use
Jan 26 – Feb 07 (6 Lectures)	Module 2: Modern Pesticide Use, Safety, and Regulations Modern Pesticide Use in Canada Federal and Provincial Pesticide Use Regulation Safe Use of Pesticides Pesticide Use Practices Outside of Canada
Feb 09 – Mar15 (12 Lectures)	Module 3: Pesticides in Soil, Air, and Water Pesticide Fate in Soil Pesticide Fate in Air Pesticide Fate in Water Sampling Soil, Air, and Water for Pesticides and Pesticide Analytical Techniques Non-target/ecological impact of pesticides

March 15 – 29 (6 Lectures)	Module 4: Future of Pesticide Use Integrated Pest Management Integrated weed Management Biopesticides and novel techniques Pesticide Discussion Topics
April 01 – 10 (5 Lectures)	Module 5: Active Learning Student Presentations Critical Appraisal of Pesticide-Related Topics

COURSE ASSESSMENT

Description of Assignments

Pesticide Perspectives Assignment: The use (and misuse) of pesticides is an intensely polarizing topic. There continue to be many pesticide-related questions that lend themselves to the development of opposing viewpoints. You will be presented with a list of topics that lead to the development of opposing views. From this, you must select one and write a critical appraisal of your chosen topic that details the arguments from both perspectives in as fair and balanced manner as possible.

Calculation Assignments: Three short calculation assignments complement the lecture materials, and each will include specific instructions on how to complete them. Assignments 1 and 2 are worth 3.5% each, and Assignment 3 is 8%.

Presentation Assignment: Choose a pesticide active ingredient currently registered for use in Canada and typically detected in our environment (e.g., in air, precipitation, surface water and/or groundwater). Your presentation must cover each of the following topics for the pesticide that you have selected: (1) its physicochemical properties, (2) its use characteristics, (3) its environmental fate in air, soil and water, (4) its environmental detection in Canada, and (5) options for alternative approaches for pest control if the pesticide should be deregistered. You can also include other aspects about the pesticide, such as its environmental detection in other countries and its toxicological effects on organisms, including sub-lethal effects or potential impacts on human health.

Assignments are submitted digitally to the appropriate Dropbox folder on the UM Learn course website. Please see the respective assignment handouts posted on the course webpage for full assignment details.

Grade Evaluation

Midterm.....	25%
Final.....	35%
Presentation Assignment.....	15%
Pesticide Perspectives Assignment(s).....	10%
Calculation Assignments.....	15%

GRADING

Letter Grade	Percentage out of 100	Grade Point Range	Final Grade Point
A+	91-100	4.25-4.5	4.5
A	85-90	3.75-4.24	4.0
B+	80-84	3.25-3.74	3.5
B	70-79	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	<50		0

IMPORTANT DATES

First day of course..... January 8, 2024
Midterm Examination..... February 16, 2024
Winter Term Break..... February 19 -23, 2024
Voluntary withdrawal date..... March 20, 2023
Good Friday (no class)..... March 29, 2024
Final day of course..... April 10, 2024
Exam period..... April 12 - 26, 2024