

Course outline (2011) SOIL3520 - Pesticides: Environment, Economics and Ethics

What are the benefits and risks of pesticide use?

Key questions: What is sustainable agriculture in our increasingly globalized world? How do pesticides benefit or risk our economy and environment? What is the role of ethics when it comes to these benefits and risks?

Topics discussed: Pesticide dilemma, Pesticide use in developed and developing countries; Historical overview of pest control methods; Currently-used pesticides emphasizing active ingredients used in Manitoba; Levels of pesticide residues in various media such as air, rainfall and surface water; Pesticide regulations in Canada such as maximum residue limits in food as well as water quality guidelines; Detailed description of pesticide fate processes in the environment; Pesticide fate modeling and risk assessment.

Instructor

Dr. Annemieke Farenhorst, 380 Ellis Bldg. *E-mail:* farenhor@cc.umanitoba.ca. *Skype address:* afarenhorst. *Phone:* 474-6858. *Office hours:* Usually at least an hour after classes, or by appointment.

Teaching assistant

Mr. Paul Messing, Ph.D. student. *E-mail:* paul@messing.ca. *Office hours:* By appointment.

Course materials: Materials for exams will be drawn exclusively from material presented in lectures and that posted on Angel (<https://angel.cc.umanitoba.ca/default.asp>). Other course material is on reserve in Ellis Room 362 and can be reviewed between 8am-noon and 1-4pm each day (contact Lynda Closson, Ellis Room 362, phone 474-8153, e-mail lynda_closson@umanitoba.ca).

Marks (Course total = 100%)

1. Midterm exam (45 minutes) which includes half of the course material (15%)
2. Final exam (2 hours) which includes the entire course material (30%)
3. Assignment 1. Essay - what are the benefits and risks of pesticide use? (20%)
4. Assignment 2. Video Presentation - issue surrounding pesticides or their use - (20%)
5. Assignment 3. Computer simulation - factors influencing pesticide transport in soil (15%)

Tolerance on missed exams

Failure to write an exam will result in a mark of zero on that exam except when a valid medical certificate can be presented, or when there is other written proof that supports an extension for compassionate reasons.

Tolerance on late assignments

Please submit your assignment on the due date. However, early submissions will be accepted. Note that every student is allowed ONE penalty-free extension per term, i.e., an extension on assignment 1, 2 OR 3. The maximum time of that one extension is 7 days and a later submission will normally result in 0% on the assignment. A late submission of a subsequent assignment will normally result in 0% on that assignment.

Course grades (% and letter)

90 - 100	A+	70 - 75	B	50 - 59	D
80 - 89	A	66 - 69	C+	< 50	F
76 - 79	B+	60 - 65	C		

The bad stuff

It is your responsibility to become acquainted with the University's policy on plagiarism and cheating. As an example, you cannot copy text from the internet and paste it into your assignment - this will result in a grade of zero percent (F) on your assignment. In addition, any suspected case of plagiarism will be immediately reported to the Head of the Department of Soil Science with possible severer academic penalties.

Course timetable (tentative) including exam dates and due dates for assignments

<i>Date</i>	<i>Topic</i>
5 January	Lecture 1. Introduction to the course content, the instructor and students.
7 January	Lecture 2. Explanation of assignments 1 and 2. Examples of last-years video assignment. Demonstration on how to use the video camera.
10 January	Lecture 3. About pesticides and pests #1 <i>e.g., definitions, characteristics, \$ values</i>
12 January	Lecture 4. About pesticides and pests #2.
14 January	Lecture 5. History of pesticide use #1. <i>e.g., Homer (the Greek poet), Agent Orange, DDT</i>
17 January	Lecture 6. History of pesticide use #2.
19 January	Lecture 7. Current challenges including developing countries #1. <i>e.g., suicides, regulations</i>
21 January	Lecture 8. Current challenges including developing countries #2.
24 January	Lecture 9. Current challenges including developing countries #3.
26 January	Lecture 10. Current challenges including developing countries #4.
28 January	Lecture 11. Pesticide usage in Manitoba and Canada #1. <i>e.g., quantities and risk assessments</i>
31 January	Lecture 12. Pesticide usage in Manitoba and Canada #2.
2 February	Lecture 13. Demonstration on video editing equipment. Bring examples to class (optional).
4 February	Lecture 14. Examples of the impact of land management on pesticide fate #1. <i>e.g., tillage</i>
7 February	Lecture 15. Examples of the impact of land management on pesticide fate #2.
9 February	Lecture 16. Pesticide atmospheric processes #1. <i>e.g., pesticide residues in Winnipeg rainfall</i>
11 February	Lecture 17. Pesticide atmospheric processes #2. End of mid-term materials. Assignment 1 is due before February 12 at 0:00am. The assignment must be submitted as an electronic copy to farenhor@cc.umanitoba.ca with a copy to paul@messing.ca.
14 February	Lecture 18. Mid-term summary. Questions and Answers. Example questions for mid-term exam.
16 February	Lecture 19. Mid-term Exam.
18 February	Lecture 20. Pesticide atmospheric processes #3.
21 February	<i>Mid-term break (no in-class lecture)</i>
23 February	<i>Mid-term break (no in-class lecture)</i>
25 February	<i>Mid-term break (no in-class lecture)</i>
28 February	Lecture 21. Fundamental processes #1 - Pesticide sorption in soil. <i>e.g., pKa, Kf, Kd parameters</i> Assignment 1 and mid-term exam marks are returned to students
2 March	Lecture 22. Fundamental processes #2 - Pesticide sorption in soil.
4 March	Lecture 23. Fundamental processes #3 - Pesticide sorption in soil.
7 March	Lecture 24. Fundamental processes #4 - Pesticide degradation in soil. <i>e.g., radicals, kinetics</i>
9 March	Lecture 25. Fundamental processes #5 - Pesticide degradation in soil
11 March	Lecture 26. Fundamental processes #6 - Pesticide erosion, runoff and leaching <i>e.g., dispersion</i>
14 March	Lecture 27. Carry-over issues in western Canada #1. <i>e.g., group 2 herbicides</i>
16 March	Lecture 28. Carry-over issues in western Canada #2.
18 March	Lecture 29. Carry-over issues in western Canada #3. Note: Last date for Voluntary Withdrawal from Winter Term 2011 without academic penalty in all faculties and schools
21 March	Lecture 30. Student Video Presentations #1. Assignment 2 is due at the beginning of class on March 21 at 9:30am. The assignment must be submit as an electronic copy on a memory stick.
23 March	Lecture 31. An overview of spatial variable soil and pesticide parameters.
25 March	Lecture 32. Assignment 3 #1. Note: Attendance is mandatory, Substantial marks can be received for in-class participation, Please bring a laptop.
28 March	Lecture 33. Assignment 3 #2. The note stated above for Assignment 3 #1 is valid here as well.
30 March	Lecture 34. Student Video Presentations #2.
1 April	Lecture 35. Assignment 3 #3. The note stated above for Assignment 3 #1 is valid here as well.
4 April	Lecture 36. Assignment 3 #4. The note stated above for Assignment 3 #1 is valid here as well.
6 April	Lecture 37. Student Video Presentations #3.
8 April	Lecture 38. Course summary. Questions and Answers. Example questions for final exam. Assignment 3 is due before April 9 at 0:00am. Assignment must be submitted as an electronic copy to farenhor@cc.umanitoba.ca with a copy to paul@messing.ca.