



**The University of Manitoba
Faculty of Agricultural and Food Sciences**

Course title: APPLICATIONS IN AGROECOLOGY

Course Number: AGEC 4510

Academic Session Winter 2011

Credit Hours = 3

Prerequisites and how they apply to this course

Prerequisite: AGEC3510: forms the basis for the principles covered necessary AGEC4510. Students without AGEC3510 but a suitable background can enroll with the instructor's permission.

Classroom Location: Ellis Building Room 342

Meeting Days and Class Hours: Tuesday, Thursday 1:00-2:20pm

Lab Location: None. **Lab Hours:** None.

Department Office location: Ellis Building 362

Phone Number: 474-8153

Course Web Page (if applicable): None.

Instructor Information

Course Coordinator: Dr. Brian Amiro, Soil Science
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Instructors:

Dr. Chad Lawley, Agribusiness & Agric Economics
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Dr. Annemieke Farenhorst, Soil Science
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Dr. Don Flaten, Soil Science
Rm 307 Ellis Bldg, Tel: 474 6257; Email: don_flaten@umanitoba.ca

Dr. Bill Guenter, Animal Science
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Dr. Kees Plaizier, Animal Science

Rm 232A, Animal Science Bldg, Tel: 474 9500; Email: plaizier@ms.umanitoba.ca

Dr. Rob Gulden, Plant Science

Rm 115, Plant Science Bldg, Tel: 474-6080; Email: gulden@cc.umanitoba.ca

Course Philosophy

Students' Learning Responsibilities

Students are expected to attend each class session and complete all assignments by the due date. In some instances, group work is encouraged, and students are expected to collaborate in a professional and collegial manner.

Why this course is useful?

This course covers a range of topics that address current issues concerning agroecosystems. It provides an opportunity to work with instructors who specialize in various aspects of agroecology, and to perform more advanced analyses of particular issues.

Who should take this course?

This course is of interest to students wanting to learn about managed agricultural ecosystems. Although it is targeted to students in the B.Sc. Agroecology program, it is of interest to students in Agricultural and Environmental Sciences. An important aspect is the depth of the case studies, which allows students to gain specific expertise to solve real-world problems.

How this course fits into the curriculum

This is a required, core course for the B.Sc. Agroecology degree. Students typically take this course in the fourth year of their program. It can be considered as a "cap-stone" course where students get the opportunity to apply concepts they have learned throughout their degree.

Course Description/Objectives

Undergraduate Calendar Description

AGEC 4510 Applications in Agroecology Cr.Hrs.3 (Formerly 065.451) Integration of information on ecological principles, agricultural production technology and environmental and socio-economic issues through in-depth studies of issues and problems in agro ecology.

Instructional Methods

Lectures and project assignments. Four units are defined, taught by different groups of instructors.

Course Objectives

This class will involve comprehensive investigations of topics in various fields of agroecology. Within these investigations we will apply the knowledge we have learned in previous courses in our program, analyse and come to understand the complexity of issues, make evaluations of available options within topics, and synthesize new scenarios and outcomes related to the topics. The ability to work independently (or in teams) outside of the class is important.

Students will learn:

- Aspects of complex agroecological issues that involve plants, animals, the land, and socio-economic components

Students will gain experience on:

- Analysing and understanding complex issues
- Synthesizing information
- Working independently and in teams to address tasks

Learning outcomes

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

- **Evaluate practices** that influence agricultural sustainability because of ecological constraints,
- **Critically assess** ecological aspects of agroecosystems and other managed ecosystems, with emphasis on quantitative measures, and
- **Compare methods** to enhance sustainability of managed ecosystems based on ecological principles.

Description of Examinations

There is no formal examination but instructors may give tests or quizzes in some modules.

Description of Assignments

Module specific. See the Course Content.

Grades and Marking

Each module is evaluated separately, based on assignments by the instructors. Equal marking weight is given for each module at 25% of the total course mark for each.

Texts, Readings, Materials

Textbook(s) – Authors, Titles, Edition

None. Notes provided by individual instructors.

Supplementary Reading

Provided by individual instructors for each module if needed.

Course Policies

Late Assignments

Penalties for late submission of Reports are 10% per day late (i.e., a report that is 10 days late will be marked as zero).

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 Section 8, p. 27 in the University of Manitoba Undergraduate Calendar 10/11).

Use of Third Party Detection and Submission Tools

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

Group Work Policies:

Students are encouraged to work together in some modules. Check with the instructor for policies for each module.

COURSE CONTENT

SCHEDULE OF MODULES

January 6, 2011.

Introduction of course. Instructor: Brian Amiro

Module1: Pesticide use and risk

January 11 to January 27, inclusive. (6 sessions)

Instructors: Dr. Annemieke Farenhorst and Dr. Rob Gulden

Outline:

Pesticides are the active ingredients in pest control products. They are designed to mitigate or prevent the injurious, noxious or troublesome effects of pests on human life. There are over 1,200 active ingredients used worldwide in about 8,000 pest control products. Pesticides are important tools in agriculture that help to minimize economic losses caused by weeds, insects and pathogens. Although their use has helped to increase crop yields and value, they may also contribute to environmental degradation.

This section of the course discusses a range of pesticides that are important to agricultural production in Manitoba. This includes examples of the challenges that Manitoba producers have in controlling pest organisms and how Manitoba producers can improve their pest management practices to optimize pest control. This also includes examples of the extent of pesticides used in Manitoba and how the pesticides used could influence air, water and soil quality, and human health.

Evaluation:

One assignment to design a hypothetical agricultural system and then develop a beneficial pest management practice for this system. Your beneficial pest management practice should promote economic and environmental sustainability. The hypothetical agricultural system should include a range of carefully-selected crops that are relevant to growing conditions in Manitoba and grown in rotation. **Assignment due: February 10, 400pm.**

Module 2: Economics of Ecological Goods and Services from Agriculture

February 1 to February 17 inclusive (6 sessions)

Instructor: Dr. Chad Lawley

Format: The class will work through the economics of different policies that might be used to increase provision of ecological goods and services (EGS) from agriculture. An emphasis will be placed on methods of uncovering the farm-level opportunity costs of supplying EGS. EGS programs currently used in other countries will be analyzed.

Evaluation: Attendance and participation at lectures is mandatory. Students will complete an evaluation of an EGS policy proposal for Manitoba. **The policy proposal report is due March 3, 400pm.**

Module 3: Nutrient dynamics in animal systems

March 1 to March 22, inclusive. (7 sessions)

Instructors: Dr. Kees Plaizier and Dr. Bill Guenter

Format: The class will review manure production of livestock and estimate manure and urine production using the Glenlea farm as a model farm. The class will learn to estimate nutrients content in manure and urine in dairy and poultry production systems and discuss best management practices to manage nutrient content in manure and urine.

Evaluation Scheme:

Attendance and participation at lectures is mandatory. Students will prepare two short reports on nutrient content of manure and urine based on the dairy and poultry production systems, respectively. **The report is due one week after the completion of each section.**

Module 4: Manure nutrient management.

March 24 to April 7, inclusive (5 Sessions).

Instructor: Dr. Don Flaten

Format: The class will review information on the management of livestock manure nutrients for crop production and the practices that should be used to maximize the agronomic benefit of manure nutrients while minimizing the risk of losing those nutrients. The class will also learn about the regulations that govern application of manure and will develop a manure management plan that complies with those regulations.

Evaluation: Attendance and participation at lectures is mandatory. Students will complete a manure management plan. **The manure management plan is due on April 18, 900am.**