

The University of Manitoba  
Faculty of Agricultural and Food Sciences



**COURSE TITLE:** Grassland Agriculture: Plant, Animal & Environment

**Department:** Plant Science/Animal Science

**Course Number:** PLNT 4410/ANSC 4410

**Academic Session:** Winter 2011

**Credit Hours:** 3

**Prerequisites and how they apply to this course:** NA

**Classroom Location:** 134 Agriculture Building

**Meeting Days and Class Hours:** Monday, Wednesday and Friday – 10:30-11:20

**Lab Location:** Lab Section (VT) 134 Agriculture Building

**Lab Hours:** Monday 2:30-5:30

**Department Office location:** PS222

**Phone Number:** 474-8224

**Instructor Information**

**Name & Title:** Dr. D.J. Cattani, Assistant Professor, Perennial Crop Breeding

**Office Location:** PS 207

**Office Phone Number:** 474-6071

**Email Address:** cattani@cc.umanitoba.ca

**Office Hours:** Usually available before or after class or contact to set up an appointment.

**Name & Title:** Victoria Tkachuk, B.Sc.

**Office Location:** 145E Animal Science Building

**Office Phone Number:** 474-9087

**Email Address:** umtkach2@cc.umanitoba.ca

**Office Hours:** Usually available before or after class or contact to set up an appointment.

## Course Philosophy

### **Students' Learning Responsibilities**

Students are expected to attend class regularly, read assigned materials in a timely manner, participate in discussion and complete all assignments and examinations with academic integrity and honesty. Students are encouraged to ask questions for clarification and seek assistance from instructors if they require additional explanations or resources. In addition, students are expected to conduct themselves in a manner that is respectful of the learning environment, other students and instructors.

### **Why this course is useful?**

Grassland agriculture is important for animal agriculture and for the maintenance of soil quality of lands not suited to annual crop production. The relationship between plant cover, the health of the environment and the production of animals is key to understanding both the utilization of grasslands for animal feed, the productivity of the grassland and the productivity of animal agriculture. The beef production industry in western Canada has been negatively impacted by BSE and other outside influences in the past decade leading to a reduction of lands under perennial cover (pasture, hayfield and range), exposing the landscape to additional risks that come with annual crop production. The maintenance of perennial crops for animal feed provides habitats for many native flora and fauna that would not exist under annual cropping. The economic production of animals for human consumption is important, however all costs and benefits must be understood in order to achieve this in a sustainable manner.

### **Who should take this course?**

- 1) Students interested in animal production.
- 2) Students interested in the maintenance of the perennial grasslands (cultured and native) and the ecological benefits they provide.
- 3) Students interested in the use of perennial species for food and fibre.
- 4) Students interested in diversity in agriculture and how grassland agriculture can be a conduit for enhancing diversity.

## Course Description/Objectives

### **Undergraduate Calendar Description:**

PLNT 4410/ANSC 4410 Grassland Agriculture: Plant, Animal and Environment Cr.Hrs.3 (Formerly O39.441)  
Inter-relationships between the biological components of grassland agriculture as they relate to forage production on the Canadian Prairies. Topics include: utilization by wild and domestic animals, plant community relationships and role of forages in multiple land use planning.

### **Instructional Methods**

A combination of instructional methods will be used in this course. Traditional in class lectures will be delivered in combination with group discussions. Guest speakers will also be invited to give lectures, enhancing the applicability of the information given. Laboratory sessions will be used for practical instruction on plant identification and how to develop a grazing plan for any livestock operation.

### **Course Objectives**

By the end of this course, Students will:

1. Be able to identify forage crop species, assess their suitability to the area of application and formulate seeding mixtures (if applicable) and a management system for grasslands.
2. Categorize plant growth strategies and generate plant stands that provide adequate agricultural and ecological benefits to the area of concern.
3. Illustrate the production of forages and explain how plant growth and development impact forage quantity and quality.
4. Understand plant and animal interactions to develop and utilize a planned pasture system effectively.
5. Be able to identify requirements of an effecting grazing system.

### **Learning outcomes**

Learning outcomes assist: i) students to identify the knowledge, skills, attitudes and personal attributes expected of them to successfully complete their program of studies; ii) faculty to develop learning goals and objectives in their courses and programs, in prioritizing and focusing the learning experiences, and in the selection of appropriate assessment tools and; iii) potential students and outside agencies to assess the quality of our academic programs.

These learning outcomes areas include:

### **Description of Examinations**

Species Test – (in lab period) 10% February 7

Plant Section – Mid-term test 15% – February 2

Animal Section – Mid-term test 15% - March 16

Both sections – Final Exam 30% - TBA

### **Description of Assignments**

1. Forage Lab Establishment

- Laboratory (GH) establishment of perennials seeds.

2. Forage modeling assignment

- Using software program FORBEEF to model forage requirements of a herd on pasture

3. Stocking density assignment

- Calculations of stocking density required for proper pasture management

4. Grazing Plan

- Utilizing FORBEEF, stocking density calculations and the information provided from course lectures and guest speakers to design a grazing plan for your livestock operation.

### **Assignment Due Dates**

Forage Establishment Lab Report 5% – February 11

Forage modeling assignment (2.5%) – March 7

Stocking density assignment (2.5%) – March 14

Grazing Plan (15%) – March 28

### **Grade Evaluation**

The grade will be evaluated through a combination of examinations, assignments, class participation and discussion.

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

February 8	Professionalism and Ethics Workshop – 6:00-9:30PM – location TBA
February 21 - 25	Mid-Term break: No classes or examinations in most faculties and schools
March 18	Last day for Voluntary Withdrawal from all Fall/Winter Term 2010/2011 and Winter Term 2011 courses Some faculties have courses with irregular withdrawal dates, see your faculty general office for information
April 8	Classes end in most faculties and schools.

## Texts, Readings, Materials

### Textbook(s) – Authors, Titles, Edition

Undersander et al. 2005: Alfalfa Mangement Guide

### Supplementary Reading:

Heide, O.M., 1994. Control of flowering and reproduction in temperate grasses. *New Phytologist* 128:347-362.

Glover, J.D., Culman, S.W., DuPont, S.T., Broussard, W., Young, L., Mangan, M.E., Mai, J.G., Crews, T.E., DeHaan, L.R., Buckley, D.H., Ferris, H., Turner, R.E., Reynolds, H.L. and D.L. Wyse. 2010. Harvested perennial grasslands provide ecological benchmarks for agricultural sustainability. *Agriculture, Ecosystems and Environment* 137:3-12.

### Additional Materials:

Additional handouts will be given out in class.

Several textbooks (with their library call numbers) can be used as background for the course lecture which include:

- Grazing Management: An Ecological Perspective - SF 85 .G73 1991
- Range Management: Principles & Practices - SF 85 H56 2001
- Nutritional Ecology of the Ruminant - SF 95.V36 1994
- Agronomy of Grassland Systems - SB 199 P37 1997
- Forages – An Introduction to Grassland Agriculture. Volume 1. Barnes, Nelson, Collins and Moore. 2003 Iowa State University press. Call #: SB 193 F64 2003 v. 1 Location: Reserve desk

## Course Policies

**Late Assignments:** Assignments must be submitted by the end of the day (4:30pm) on the date that it is due. There will be a 10% deduction for every 24-hour period the assignment is late.

**Missed Assignments:** Unexcused missed assignments will be given a grade of zero. Where assignments are missed and excused through written notification such as a doctor's certificate of illness, evidence of death in the family, or other circumstances that are beyond the control of the student, the student may be given the following options: 1) complete the assignment and receive the late assignment penalty as describe above; 2) establish a new due date with the instructor and complete the assignment without penalty when handed in by the new due date; or, 3) the final grade will be determined by increasing the value of the final examine by the amount that would have been allocated to the missed assignment.

**Missed Exams:** Unexcused missed exams will be given a grade of zero. Where exams other than the final exam are missed and excused through written notification such as a doctor's certificate of illness, evidence of death in the family, or other circumstances that are beyond the control of the student, the student may be given the following options: i) re-schedule a date for the exam with the instructor and complete the exam at that time ( the instructor has the option to set a different exam); or, 2) the final grade will be determined by increasing the value of the final examine by the amount that would have been allocated to the missed exam. If the final exam is missed and an appropriate excuse has been provided, another exam date will be set at the discretion of the instructor.

### **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 7, p. 29 in the University of Manitoba Undergraduate Calendar 09/10).

**Additional Comments:**

## 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:** Where assignments are assigned as group projects, students will be required to hand in one assignment with the names of all students that participated in the assignment listed on the title page of the assignment. In addition, each student will be asked to complete a statement of their contribution to the assignment and their assessment of their partner's contributions to the assignment. For individual assignments, students may cooperate and discuss the assignment, however, each student must hand in their own assignment, written in their own words. Duplicate assignments (either whole or in part) will be considered acts of academic dishonesty and will be subject to disciplinary action according to University policy.

## Course Content

Topic	Lecture Date or Number of Lectures
<b>THE PLANT</b>	
Grass plant growth and development and methods of quantifying developmental stages.	1 lecture
Flowering of perennial grasses.	1 lecture
Mixtures of species: natural and many cultivated grasslands consist of mixtures of co-existing or co-occurring plant species. Reference to competitive ability, seasonal distribution and animal benefits will be covered.	2 lectures
Utilization of grassland plants.	2 lectures
Forage establishment, fertilization and other management.	1 lecture
Stand persistence and productivity including stress evaluation and monitoring techniques.	1 lecture
Forage quality parameters emphasizing differences between and within grass and legume species.	2 lectures
Principles of hay and silage production.	1 lecture
Seed production of forage species. Coverage of the major forage seed crops	2 lectures

produced in Manitoba.	
Native grasses weeds and invasive species on pasture	1 lecture
Grasslands for environmental quality.	1 lecture
<b>THE ANIMAL</b>	
History and distribution of grasslands	2 lectures
Digestive system of herbivores	2 lectures
Factors influencing digestion efficiencies	1 lecture
Voluntary feed intake, animal utilization and low quality fibre sources	2 lectures
Mineral nutrition and supplementation	1 lecture
Organic beef production on pasture	1 lecture
Water quality and systems on pasture	1 lecture
Grazing systems	3 lectures
Plant-Animal interactions	1 lecture
Foraging behaviour	1 lecture
Wildlife habitat	1 lecture
Greenhouse gas production	1 lecture