UM | Faculty of Agricultural and Food Sciences

Soil 0620 Soil Conservation and Management

Course Syllabus
Winter 2021

Calendar Description
Land capability for agriculture; storage, use of water and water use efficiency; saline and alkaline soils; soil acidity; soil erosion and conservation; tillage, cropping systems and rotations; fate of biosolids, pesticides.

Course Objectives
At the completion of this course, the student should be able to:
1. explain relationships among soil, water and air as they relate to environmental quality and agriculture in western Canada,
2. interpret soil, climate and landscape data for the purpose of identifying potential environmental impacts of agricultural practices, as well as the most relevant beneficial management practices to minimize those impacts
3. pass the Soil & Water Management section of the Prairie Province Certified Crop Advisor exam if they decide to write it.

How this course fits into the curriculum
SOIL 0620 is a prescribed course in the Crop Management option of the Agriculture Diploma program. This course is designed to provide applied learning exercises in the areas of agricultural production practices, agricultural sustainability, limitations to agricultural production and environmental impacts on the environment. These topics are especially current with recent increased public awareness and scrutiny of food production practices and agricultural impacts on the environment.

Prerequisites and how they apply to this course
The prerequisite course for the class is SOIL 0420 (Soil Resources and Productivity). The prerequisite course provides fundamental knowledge about soil and landscape properties and how they are described and reported. This knowledge will be utilized for applied learning by considering practical issues involved in soil and water management.

Instructor
David Lobb, Professor, Department of Soil Science, 204-296-4644, David.Lobb@umanitoba.ca

Teaching Assistants (Laboratories)
Ehsan Zarrinabadi (zarrinae@myumanitoba.ca)
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Time and Location
Lectures and labs will be offered online and synchronously (live), via Cisco Webex within UM Learn. Lectures will be delivered Tuesdays and Thursdays from 10:00-11:15, and laboratories will take place in two separate sections (B01 and B02, pre-assigned) on Tuesdays following the lecture from 11:30-12:45 and 1:00-2:15. Students are expected to attend all lectures and laboratories. The synchronous delivery will allow discussions between instructor and students during lectures and laboratories. Regularly scheduled lectures and laboratories will provide for steady progress towards course objectives and learning outcomes.

Class Communication
The instructor will attempt to open class meetings 15 minutes before their scheduled start and extend them 15 minutes past their scheduled end to facilitate individual and group discussions with students. Outside of these meetings, students can contact the instructor and TAs by email, and the instructor and TAs will attempt to respond within 48 hours. Students' questions and concerns about course content will be addressed at the start of the next class meeting. Individual telephone meetings with the instructors can be arrange by appointment.

Course materials and emails will be delivered by the instructor and TAs to the class via UMLearn. The Subject line of emails from students to the instructor and TAs must start with "**SOIL 0620**, **Last Name**, **topic**..."

Students are expected to regularly access their official University email account, which is the email address that will be used for all communication in this course. For full details of the Electronic Communication with Students please visit: http://umanitoba.ca/registrar/email_policy/.

Recording of Lectures
Students are not permitted to record lectures without the permission of the instructor.

Course Materials
The lecture slides are available for students to download from the UM Learn course page. Each student is expected to download these slides and have them for reference during class. The PowerPoint slides constitute the primary study material for the class. The slides are made available to facilitate learning the course material and to provide an opportunity for interactive class sessions. Review questions are provided at the end each section of lecture slides and are intended to assist students by testing their knowledge of course material prior to the exams. Students are expected to study the review questions on their own and seek clarification on any material that they do not fully understand prior to writing exams. Each week there will be a short quiz on the materials covered in the previous week, so students are encouraged to keep up on lecture materials and attend classes. Class attendance is needed if students are to gain a full understanding of the course material. Students who attempt to pass this course without attending class, do so at their own risk.

Electronic copies of the Manitoba Soil Management Guide and laboratory handouts will be provided to students. No other textbook is required. Some reading materials will be provided to supplement the lectures for some course topics.

Students' rights and responsibilities
For student resources, including student accessibility services, writing and learning support, library information, academic advisory services, student advocacy, and policies regarding student discipline, intellectual property and reporting sexual assaults, please see Schedule A posted on this course's UM Learn website.

Description of Quizzes and Examinations
Ten (10) weekly quizzes will be held at the end of the class period (first 5 minutes) each Thursday. Two (2) 25-minute exams will be held during class period at the completion Sections 2 and 4 in the course. The course section exams are tentatively scheduled for February 4 and March 4. Each exam will cover the content of the section(s) just completed. A final exam will be scheduled during the exam period at the end of the term and will cover all course (focusing on the fifth and final section) and the lab content.

Missed Quizzes and Exams
If students know beforehand that they will not be able to attend a quiz or an exam, they must contact the instructor to make alternate arrangements. Students who miss a quiz or an exam without notice will receive a grade of zero on the quiz or exam.

Laboratory Assignments
Laboratory assignments are designed to be completed during the laboratory session and handed in at the end. They will be graded and returned the following week. Lab exercises involve interpretation of environmental information and its application to a case farm. For the most part, the concepts will be covered previously in the lectures and students should have their lecture notes on-hand during the lab to refer to the material when needed. During some of the lab periods, students will perform calculations and should have a calculator. The lab assignments will utilize a real farm as a case study; this is meant to provide context for the exercises and improve proficiency in the application of environmental information for addressing issues in soil conservation and management.

Late or Missed Lab Assignments
Laboratories must be submitted at the end of the day on the day of the laboratory period in order to accommodate timely feedback of grades and comments. If students know beforehand that they will not be able to attend a laboratory session, they should contact the instructor to make alternate arrangements. Students who do not submit a laboratory assignment at the end of the day of their lab period will receive a grade of zero on that exercise. Missed laboratory exercises can be made up with an excused absence provided it is completed prior to the distribution of marks to the class for that lab.

Course Evaluation:
Student performance will be based on weekly quizzes, laboratory assignments, two mid-term exams and a final exam. Each Thursday a short quiz will be given to ensure students are keeping up with the course materials. Quizzes will consist of short questions in multiple choice, true and false and fill in the blank format. There will be 10 quizzes in total. There will be two mid-term exams; there will be no quizzes on those two weeks. Lab information and assignments will be distributed on the Tuesday mornings before the laboratory, and they must be submitted by midnight on the day of the laboratory. There will be five laboratories and five laboratory assignments. There will be a final exam based on the entirety the course content with greater focus on the material following the second mid-term exam.

Weekly Quizzes (10) ……....15%	10:00-10:05
Mid-term Exams (2) 25%	tentative dates: Feb 4, Mar 4 (10:00-10:25 a.m.)
Laboratory Assignments..... 30%	
Final Exam 30%	

Lecture and Laboratory Content and Schedule

Date	Class Topic	Lab Topic
Agricultural Land Resource		
Jan 5	Soil orders and their productivity limitations	Laboratory and Case Farm Intros
Jan 7	Landscape impacts on productivity	
Jan 12	Applying ag capability to soil management decisions	1. Temperature risk
Agricultural Climate Resource		
Jan 14	Weather-climate, FFDs, heat units, probability	
Jan 19	Precipitation, soil moisture and risk	1. Temperature risk
Jan 21	Crop water demand/use/balance, moisture management	
Jan 26	**Classes cancelled – Full Day Virtual Field Trips**	
Water Management		
Jan 28	Surface water issues, riparian zones	
Feb 2	Groundwater issues	2. Water Resources and Moisture Risk
Feb 4	Groundwater issues / **1st mid-term (Sections 1&2)**	
Feb 9	Soil salinity/sodicity and management	2. Water Resources and Moisture Risk
Feb 11	Drainage, irrigation	
Feb 16	**Winter term break**	
Feb 18	**Winter term break**	
Feb 23	Irrigation suitability / Nutrient management – fertilizer use	3. Drainage and Irrigation
Nutrient Management		
Feb 25	Nutrient cycling, balance, fertilizer use	
Mar 2	Productivity, target yield, manure	3. Drainage and Irrigation
Mar 4	Manure management / **2nd mid-term (Sections 3&4)**	
Soil Management Issues		
Mar 9	Soil Erosion	4. Manure Management
Mar 11	Water erosion risk and management	
Mar 16	Wind erosion risk and management	4. Manure Management
Mar 18	Tillage erosion risk and management, trace elements	
Mar 23	Soil organic matter and its management	5. Erosion Risk
Mar 25	Soil structure issues and management / SRI	
Mar 30	Soil health / Final exam review and practice	5. Erosion Risk

Final Exam -- To be scheduled