

Please Note: This *Course Outline* is an important step in updating the format of our distance courses. If for any reason the *Course Outline* does not match the print *Course Guide* or online course information, the *Course Outline* shall be taken as correct.

## COURSE SYLLABUS

**COURSE TITLE:** Soils for Horticulture

**COURSE CODE:** SLSC 14.6

**TERM:** Term 2 2014-15

**COURSE CREDITS:** 6

**DELIVERY:** PHC

**COURSE SECTION:** W02 or W06

### Course Description

This course will provide an introduction to the Soil Science concepts most important to the study of Horticulture.

### Course Objectives

By the end of this course, students should be able to:

1. understand some basic concepts of soil fertility and plant nutrient management
2. understand and rationally plan soil management for your own Horticultural projects
3. gain a working understanding of soil science to able to critically assess and utilize other resources for horticultural products and practices

### Course Overview

As with any subject, it is better to learn the basic definitions and concepts of Soil Science before trying to understand more complex issues. The course will begin with learning about the principles of Soil Science, then look at how these principles affect plants growing in either soil or potting media. The focus will be on understanding how the conditions of the rooting environment affect the growth of plants, and how to improve these conditions.

Remember this is an introductory course and it will not provide detailed information for any one of the many branches of Horticultural Science. For example, there will not be a detailed description on how to fertilize or prepare a potting mixture for tomatoes grown in a greenhouse, nor will there be a list of the strict soil management guidelines for turfgrass maintenance. You will gain basic knowledge that you can put into practice in your own Horticultural practices.

## **Your Instructor**

Lyle Cowell

### **Contact Information**

You will communicate with your instructor through the Blackboard Learning System, Messages (Course Mail) on all matters. You can expect a reply, from the messages (course mail) tool, within 48 hours. Instructors will not be using your personal email for communication. If you do need to speak with the instructor directly, a contact number is listed below.

**Please watch the messages (course mail) and announcements for information from the instructor and the PHC office**

Phone: 306.863.2391

### **Profile**

Lyle Cowell, the instructor for Soils for Horticulture, wrote this course while employed in soil fertility and remediation research at the Dept. of Soil Science at the University of Saskatchewan. He is now living on the family farm in NE Saskatchewan, in the regional mix of Thick Black Chernozemic and Luvisolic soils. During the day, he works as a regional agronomist with conventional agriculture, but much of his free time is spent in horticultural hobbies including houseplants, gardening, landscaping and fruit and berry trees. He shares this interest with his wife, who has a degree in Horticulture. Lyle enjoys horticulture, despite the challenges it faces in our climate.

This is an introductory extension course, and your instructor recognizes that there are challenges to each of you outside just the course material. His goal is not to 'pass or fail' you, nor to expect you to have a full understanding of Soil Science. He hopes you will gain an appreciation and new understanding of soil properties that you can use on a day to day basis to improve your horticultural hobbies and business. He does not expect you to 'memorize' the course, but to understand basic concepts. He hopes that you will also be willing to contact him when you have course questions of any type, by course email or telephone.

## **Additional Resources**

### **Readings/Textbooks**

There is not a required textbook for this class, but you may want to borrow a Soil Science text from a library from time to time. There is a multitude of useful texts. The following are examples of good references for general Soil Science information. One or more of these texts should be available from a University or College library. In addition, it is recommended that students utilize web based resources or other relevant material when researching topics for course projects.

Brady, N.C. 1996. *The Nature and Properties of Soils*. 11th ed. Macmillan Publishing Company. New York. 621 pp.

California Fertilizer Association. 1990. *Western Fertilizer Handbook*. Horticulture Edition. Interstate Publishers, Inc. Danville, Illinois. 279 pp.

Mengel, K. and Kirkby, E.A. 2001. *Principles of Plant Nutrition*. 5<sup>th</sup> ed. International Potash Institute. Worblaue-Bern, Switzerland. 687 pp.

Tisdale, S.L., Nelson, W.C., Beaton, J.D., and Havlin, J.L. 1993. *Soil Fertility and Fertilizers*. 5th ed. Macmillan Publishing Company. New York. 634 pp.

Textbooks are available from the University of Saskatchewan Bookstore:

[www.usask.ca/consumer\\_services/bookstore/textbooks](http://www.usask.ca/consumer_services/bookstore/textbooks)

## Course Schedule

Week	Module	Evaluation Due Date
0		Start of Term: Jan. 19 Assignment 1A- Part 1 Due: Jan.20-23rd
1	Module 1 – Soil Development and Composition	
2	Module 2 – Soil Chemical Properties	
3	Module 3 – Soil Physical Properties	
	<b>Midterm Examination</b>	Complete: Feb.9-13
4	Module 4 – Water: An Essential Nutrient	
5	Module 5 – Soil Fertility  English, J. & Maynard, D. (1978). A Key to Nutrient Disorders of Vegetable Plants. In <i>Hortscience</i> 13, (pp. 28-29). American Society for Horticultural Science. <b>[PDF in Blackboard]</b>	
6	Module 6 – Synthetic Fertilizers	Assignment 3 – Suggested Activity Due: March 2
7	Module 7 – Synthetic Fertilizer Application	
8	Module 8 – Natural Soil Amendments	
9	Module 9 – Potting Culture	Assignment 2 Due: Mar. 23
10	Module 10 – Measurement and Calculation of Nutrient Requirements	Assignment 1B - Part 2 Due: Mar. 27

	<b>FINAL EXAM</b>	March 28
--	-------------------	----------

Please note that the above schedule is just a rough estimate of how you should balance your time. Feel free to work as fast or slow as you want as long as the assignments are completed and emailed on time.

*Note: If for any reason the Course Syllabus Reading List does not match the Module Reading List, the Course Syllabus shall be taken as correct.*

## Grading Scheme

Assignment 1 A (2%) and B (3%): Reflection on Course Goals	5%
Assignment 2: Major Project	30%
Assignment 3: An Activity	15%
Mid-Term Exam	15%
Final Exam	35%
Total	100%

Information on literal descriptors for grading at the University of Saskatchewan can be found at: <http://students.usask.ca/current/academics/grades/grading-system.php>

Please note: There are different literal descriptors for undergraduate and graduate students.

More information on University policy related to grading and examinations can be found at: <http://policies.usask.ca/policies/academic-affairs/academic-courses.php>

The University of Saskatchewan Learning Charter is intended to define aspirations about the learning experience that the University aims to provide, and the roles to be played in realizing these aspirations by students, instructors, and the institution. A copy of the Learning Charter can be found at: <http://policies.usask.ca/documents/LearningCharter.pdf>

## Evaluation Components

### CCDE Writing Centre – Quality Writing Help for Free!

Anyone taking a distance class (online, independent studies, televised, or multi-mode delivery) administered by the CCDE can use this free service. The Writing Centre provides tools and support to help you write effective essays, reports, or reviews. Simply submit a project draft, and a qualified tutor will assess your work and offer advice to improve your project. Contact the CCDE Writing Centre at <http://www.ccde.usask.ca/writing>

## **Assignment 1: Reflection on Course Goals (located under Assignments in the course menu)**

**Value:** 5% of final grade

**Due Date:** See course schedule above - **Part 1** - Complete this assignment before you begin Module 1 and submit to instructor no later than one week after the beginning of the term.

See course schedule above - **Part 2** – Complete part 2 at the end of the term. You may also turn it in with your final exam.

**Purpose:** To get you to think about and articulate your course goals and review your learning.

**Description:** Please complete **Part 1** and **Part 2**.

### **Part 1**

Before you begin your study of this course, answer the following questions:

*a. Why is knowledge of Soil Science important to your Horticultural interests?*

In answering this question, you will want to answer for yourself, “what is soil science?” and then reflect on how soil science applies to your horticultural interest.

*b. What do you want to learn or accomplish in this course?*

In answering this question, you are actually setting some objectives for yourself. You will want to think about how you will apply what you expect to learn in your day-to-day operation. An ability to apply what you learn is one measure of whether you have reached your objective.

This is not a test of your prior knowledge. Rather, it is a way for you to build a framework for your learning and help you integrate what you are learning (or hope to learn) in your day-to-day work experience. It is also means for us to see if this course is answering the questions you want answered.

You do not need to write a lengthy response to these questions—no more than one page in total. Complete this assignment before you begin Module 1 and mail one copy to your instructor and keep one copy for yourself.

### **Part 2**

At the end of the course, answer these same questions again, except answer 'b' as “what did you learn from this course and how can you apply what you learned to your horticultural operations?” In writing your answer this time, review what you wrote at the beginning of the year. In addition to identifying any new knowledge that you can apply to your work, you may also want to reflect on how well this course met the needs you outlined at the beginning of the year. Again, your answer should be about one page in length.

Remember to submit at the end of the term. You may also turn it in with your final exam.

Suggestion: As you complete each module, make notes, or even keep a journal, answering these questions for each module. You'll find that completing this assignment at the end of the term, then, is a "piece of cake."

## **Assignment 2: Major Project (located under Assignments in the course menu)**

**Value:** 30% of final grade

**Due Date:** See course schedule above. Complete and send in the assignment before you begin studying the last module.

**Purpose:** Soil Science for Horticulture is an introductory course, and will not provide you with detailed information about your own Horticultural interests. This project is your opportunity to investigate Soil Science issues for your specialty (greenhouse bedding plants, golf course management, potato production, houseplant care, orchard production, etc). **Please note:** Only crops that can be legally grown in Canada can be used for this paper. If you have questions about your chosen crop, please contact the instructor well in advance of the completion deadline.

**Description:** In a short report, provide the details that someone would need to manage the soil or potting media of your specialty. Write the report so that anyone could understand the information and put it to use. Include the "how? when? why? where?" information. Consider all aspects of the rooting environment covered in this course: soil texture, soil physical and chemical properties, water use, soil fertility needs, the need for, or benefits of using synthetic fertilizers and soil amendments. However, be concise, and include only important details.

The following is a general guide;

- pick a fairly narrow topic on a subject that most interests you.
- write a short report of no more than 5 typed pages.
- Don't restrict yourself to the information in this course. Read published information, talk to experienced Horticulturists, visit your library and local government extension office, talk to local University or College instructors, and draw on your experience.
- Use diagrams and pictures if possible. If special equipment is required, provide details on its best use and function. Where is it purchased? What is the cost?
- You may want to provide some simple analyses that you have conducted yourself. For example, if your paper described methods of preparing a potting mixture, you may want to include the water holding capacity or pH of the mixture.

Begin thinking about and finding information for your project immediately. By the end of completing the first module, prepare an outline of your paper. If you have any questions about this assignment, be sure to contact your instructor. Once you've drafted your outline, please contact your instructor so that you can discuss your chosen crop and the outline for your project.

## **Assignment 3: Suggested Activity (located under Assignments in the course menu)**

**Value:** 15% of final grade

**Due Date:** See course schedule above. Complete and submit your written activity report as soon as possible, to avoid too much work near the end of the class. At a minimum, send your report before beginning Module 10.

**Purpose:** To draw on material in all modules for your answer.

**Description:** For this assignment, do only one of these:

- choose one of the at-home activities listed below in “Suggested Activity” and write a report;

or

- write a detailed answer to one of the designated study questions on the next page.

### **Suggested Activity**

A number of suggested activities are included as part of the course content. You are expected to attempt all of these activities at home. For this assignment, you are required to submit at least a **one-page** report of **one** of these activities for marking. If you choose one of the activities, which require you to grow and observe a plant under specific conditions, you will want to begin your activity immediately. Submit a report of **one** of these activities:

- Module 3: the effect of compaction on plant growth
- Module 3: the effect of temperature on germination
- Module 4: measuring moisture constants of soil or potting media
- Module 5: Nitrogen Fixation by Legumes
- Module 7: drawing a root system in soil, media, or hydroponics in both seedling and mature stages
- Module 8: design a compost system.
- Use your imagination! Design and complete a “hands-on” project to answer a question of your own. Be sure to contact your instructor before you begin this option.

In the case of the activities that require a small project, give a description of what you observed and learned in the activity. (The instructions included with the at-home activity guide you.) You may want to include a picture or diagram to help explain your observations.

Check your table of contents for the page number for these activities. The at-home activities for Assignment 3 are listed in the table of contents under a separate heading “At-Home Activities for Assignment 3. You will find this list after the module contents and before the list of figures.

### **Study Questions**

- Module 4: Question 6 **or** 7
- Module 5 Question 1 **or** 13
- Module 7 Question 2
- Module 8 Question 4
- Module 9 Question 3

## **Mid-Term Examination (located under Assignments in the course menu)**

**Value:** 15% of final grade

**Due Date:** See course schedule above

You are encouraged to look through this examination before you start work on the course and keep notes as you go along. You will have only 1 try at this exam but no time restriction to complete. You will be able to complete a portion, 'save' it, and return later, but you may only 'submit' it once.

**Length:** About 1.5 hours. There will not be a time restriction for completion.

**Purpose:** The exam will consist of multiple choice, true/false and definitions, and short answer questions similar to those in the study guide.

**Description:** Online exam, 'open book'.

## **Final Exam (Online & Closed book)**

**Value:** 35% of final grade

**Date:** See Course Schedule

**Format:** The final examination will be an online exam and open for 24hrs (from 9:00 a.m. on the exam day until 9:00 a.m. the following day). Please go to the assignment tool to view the exam within that time frame.

It is very important to note that this is a 3-hour exam. Once you log in and access the exam the clock will start ticking in which you will have only 3 hours to complete. At the end of that 3-hour time period, you will be logged out of the exam.

Please be aware that once you have logged into the exam you cannot leave or try to navigate to another part of the course. If you do exit the exam, you will not be allowed back in as you are only allowed one attempt at this exam.

The 3-hour time limit does not allow you enough time to look up answers or review assignments so make sure you are prepared.

**Description:** If you have completed all of the study questions and projects, reviewed the new terms in your glossary, and are confident in simple fertilizer calculations, you should have no problem with the final exam. The final examination will test your knowledge of the material in each and every module. Calculator is permitted.

## **Submitting Assignments**

To obtain your best mark, you should complete all assignments and attempt all questions in each assignment in the course. If you know only part of the answer, put it down and you may receive partial marks. Remember, instructors find it very easy to mark a question that has not been attempted.



**You are expected to submit assignments by the due dates indicated in your Course Syllabus.** The instructor has the discretion to penalize late submissions or not. Assignments submitted beyond the final exam date may or may not be accepted by the instructor. If you experience legitimate problems such as accident or family illness, discuss it with your instructor so that some suitable arrangement can be worked out.

**Before submitting any assignment, ensure to save a backup copy of it in case the original is lost.**

All of the assignments are located under assignments in the course menu.

Please submit all assignments online, using the Assignments tool in Blackboard.

#### **Assignments Tool in Blackboard:**

1. From the Course Home Page, on the left menu click Assignments.
2. On the Assignments page, click the Assignment you want to submit and download any attached files.
3. In the Upload Assignment area, key in the Assignment Materials text box or attach your file. Note the file naming rules.
4. Add any Comments for your instructor.
5. Click Submit to submit the assignment.
6. Review Submission History that appears after you Submit. Click OK if you need to go back and revise.

#### **For Further Information about Using the Blackboard Assignments Tool:**

1. From inside Blackboard, click on the Help tab to see U of S Course Tools/BBLearn 9.
2. On the tool bar under Course Tools, click the Students' Help tab and then click one of the following options:
  - Videos and then click Working with Assignments (2 min 59 sec video).
  - Course Tools Help Documents and click Working with Assignments (a pdf document)
  - FAQs

#### **Checking Your Assignment Grades**

1. From the Course Home Page, on the left menu click My Grades.

2. To see the grade for the specific assignment, click on the assignment grade.
3. View the details of your grade and any instructor comments.

The following criteria are considered in grading assignments and the final examination:

- Demonstrated analytical/critical insight ability
- Evidence of appropriate level of understanding of course content
- Breadth/depth of coverage of the question/s
- Assignment organization
- Syntax, technical errors, clarity of expression

## Integrity Defined

“Integrity is expected of all students in their academic work – class participation, examinations, assignments, research, practica – and in their non-academic interactions and activities as well.”  
(Office of the University Secretary)

It is your responsibility to be familiar with the University of Saskatchewan *Guidelines for Academic Conduct*. More information is available at

<http://www.usask.ca/secretariat/student-conduct-appeals/IntegrityDefined.pdf>

## Acknowledgements

### Course Author

Lyle Cowell, M. Agric.

### Instructional Design and Course Development

#### Instructional Designers:

Margareth E. Peterson  
Jordan Epp  
Robb Larmer

#### Art Work:

Michael Misanchuk  
Lyle Cowell  
David Klassen

#### Support Staff:

Cindy Klassen  
Diana Hebig