South Central College

PLSC 1200  Soils II

Course Outcome Summary

Course Information

Description
This course will include both the technical and practical information that should be of assistance to a student who will farm or go into the fertilizer business. The course deals with the basic soil-plant relationships and the effects of fertility. Detailed information of soil test results will be covered. Materials from the Certified Crop Advisor program will be used.

Total Credits 3
Total Hours 48

Types of Instruction

Instruction Type Credits/Hours
Classroom Presentation

Pre/Corequisites

PLSC 1100 Soils I

Institutional Core Competencies

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

Course Competencies

1. Understand the principles of soil fertility which are vital for efficient crop protection and environmental protection

   Learning Objectives
   List the 17 essential nutrients for plant growth.
   Explain the concept of cation exchange capacity
   Identify the major nutrient anion and cation from in soil.

2. Understand the concept of soil pH and be able to explain the many factors which influence and determine the soil's pH.

   Learning Objectives
   Define pH, anion, cation and cation exchange capacity
   Evaluate a soil’s pH and make a lime recommendation for that field.
Identify symptoms of crops with poor pH values
Calculate soil lime recommendations
Compare the different liming materials

3. **Evaluate and understand the role that nitrogen has in crop production in order to make management decisions to maximize production with minimum environmental damage**

   **Learning Objectives**
   - List the various organisms responsible for N fixation
   - Define nitrification, ammonification, denitrification, mineralization, volatilization, immobilization, leaching
   - Discuss the factors which affect nitrification
   - Describe nitrogen transformations and interactions
   - Describe the nitrogen cycle
   - Calculate nitrogen recommendations for a given corn field
   - Determine yield goals

4. **Apply the concepts and properties of phosphorus to make fertilizer recommendations to maximize production and minimize effects on the environment.**

   **Learning Objectives**
   - Explain the various roles phosphorus has in plant growth
   - Identify phosphorus deficiency symptoms in corn, soybeans, and alfalfa
   - Articulate the behavior of phosphorus in the soil.
   - List the factors affecting phosphorus availability in the soil
   - Calculate phosphorus recommendations for a corn, soybean and alfalfa field

5. **Apply the concepts and knowledge of potassium to make fertilizer recommendations to maximize production and minimize effects on the environment.**

   **Learning Objectives**
   - Explain the various roles potassium has in plant growth
   - Identify potassium deficiency symptoms in corn, soybeans, and alfalfa
   - Articulate the behavior of potassium in the soil.
   - List the factors affecting potassium availability in the soil
   - Calculate potassium recommendations for a corn, soybean and alfalfa field

6. **Acquire the understanding of the role secondary nutrients play in crop production and how to manage these nutrients**

   **Learning Objectives**
   - Explain the function of each of the secondary nutrients
   - Determine the sources of secondary nutrients
   - Identify secondary nutrient deficiencies
   - Determine secondary nutrient fertilizer recommendations for various crops and soil types

7. **Apply the concepts and knowledge of the eight micronutrient**

   **Learning Objectives**
   - Explain the function of each of the micronutrients
   - Determine sources of micronutrient
   - Determine micronutrient recommendations
   - Identify micronutrient deficiencies

8. **Read and evaluate a soil lab test report**

   **Learning Objectives**
   - Practice the correct procedure in collecting good soil samples
   - Describe the various methods of collecting soil samples, by soil type, grid sampling, composite
   - Interpret the information on a soil lab test.
   - Use the soil test results to make a fertilizer recommendation

9. **Demonstrate and recommend fertilizer rates based on the facts given and the knowledge of the nutrient characteristics**

   **Learning Objectives**
   - Be aware of the University of Minnesota fertilizer recommendations
Calculate using the math formulas to determine the recommended amounts of N, P and K
Understand the concept of economic optimum yield

10. **Display professional demeanor**

**SCC Accessibility Statement**

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Additional information and forms can be found at:  [www.southcentral.edu/disability](http://www.southcentral.edu/disability)

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