SOS 5116
Environmental Nutrient Management

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Credit Hours: 3 credits

Delivery Method: Web
Out-of-state students should consult the UF Soil and Water Science Department Web site for current tuition information http://soils.ifas.ufl.edu/distance/

Online Meetings/ Chats: Thursdays 6 - 7 pm. For an orientation how to use Breeze Live please visit http://mbreeze.ifas.ufl.edu/p37953287/

Course Description
The prerequisite for this course is SOS 3022 or SOS 5050C. In this course chemical properties of plant nutrient sources will be discussed to familiarize students with materials use and their status as a non-renewal natural resource. Methods and rates of application, effects on soil reactions, plant requirements and their environmental effects on the soil and water ecosystem are discussed to identify impacts of specific plant nutrient sources.

Course Objectives
1. To familiarize the student with the different nutrient sources, plant nutrient terminology, and chemical properties of commercial plant nutrient sources as they relate to their utilization and environmental impact.
2. To acquaint the student with the basic chemical reactions of plant nutrient sources with the soil and the environmental fate of the nutritional elements whether it be loss by leaching, plant uptake, fixation or soil retention.
3. To acquaint the student with nutrient management practices which minimize environmental impact of plant nutrient application.

Course Web Site: http://lss.at.ufl.edu/ , Click on Vista, then University of Florida. Login using your Gatorlink username and password. If you are registered for the course, you will see it listed under MyWebCT. Students must login to class website within the first 2 weeks of class.

Course Format

Internet-based with bulletin board, chat room and e-mail support. The course will be offered in independently graded modules on a timed basis. All students will progress through the course together, taking exams as they complete each module. **Class is offered every Spring.**

Textbook and Readings
Students are required to purchase a set of notes developed by the Instructors and a text book.

Lecture Notes can be purchased from University Copy & More. at 1620 W. University Avenue, Gainesville, FL 32603. Phone No. 352.372.7436. Fax No. 352.373.7505 Email address: service@university-copy.com Web Address: www.university-copy.com Please request the Internet based version of SOS 5116, and not the Campus version. Ask for SOS 5116 Sartain/Daroub Internet Based Graduate Course for Spring 2006.

Also purchase the following text book *Soil Fertility and Fertilizers,* 7th edition. Published in 2004 by Havlin, Beaton, Tisdale and Nelson. ISBN: 0130278246 **OR** the 6th Edition. Published in 1999 by Havlin, Beaton, Tisdale and Nelson. ISBN 0-13-626806-4.

Grading System

Module	% of 100 points
Module I	35
Module II	25
Module III	20
Problem Sets	20
Total	100

Final Grade Determination

A = 90+
B+ = 87-89
B = 86-80
C+ = 77-79
C = 76-70
D+ = 67-69
D = 66-60
E = <60

Academic Honesty
As a result of completing the registration form at the University of Florida, every student has signed the following statement: "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University."

Lecture Topics

(Dr. Sartain will be the instructor for lectures 1 through 6)

Lecture 1: Introduction

1. Lecture 1 will cover the following topics:
    1. Course Outline and objectives
    2. Discussion of the Problem Sets
    3. Historical Review
    4. Fertilizer Tag
    5. Fertilizer Law
    6. Fertilizer Usage, World, US, FL

Lecture 2: Properties of Nitrogen Plant Nutrient Sources

1. Lecture 2 will cover the following topics:
    1. Inorganic Sources
    2. Slow Release N materials
    3. Rules for working fertilizer problems in homework, sample problems included with solutions
2. Complete Problem Set 1

Lecture 3: Properties of Nitrogen Plant Nutrient Sources

1. Lecture 3 will cover the following topics:
    1. Nitrogen Solution Fertilizers
    2. Organic N sources

Lecture 4: Soil Nitrogen and Associated Reactions

1. Lecture 4 will cover the following topics:
    1. Organic N
    2. Reactions of NH_3 with the soil
2. Complete Problem Set 2

Lecture 5: Soil Nitrogen and Associated Reactions

1. Lecture 5 will cover the following topics:
    1. Reaction of NH_4^+ with the soil
    2. Reactions of urea with the soil
    3. Factors affecting nitrification

Lecture 6: Environmental Issues of Nitrogen

1. Lecture 6 will cover the following topic:
    1. Fate of N fertilization
2. Complete Problem Set 3
3. **Complete Module I Exam**

(Dr. Daroub will be the instructor for lectures 7 through 9)

Lecture 7: Phosphorus Plant Nutrient Sources

1. Lecture 7 will cover the following topics:
    1. Manufacture and properties of P plant nutrients
    2. Soil phosphorus reactions
2. Read textbook pgs.
3. Print lecture handout - PDF file
4. Watch narrated presentation - Real file

Lecture 8: Phosphorus

1. Lecture 8 will cover the following topics:
    1. Factors influencing P retention in soils

2. P levels required in plant tissue
3. Soil testing for P

Lecture 9: Environmental issues with Phosphorus

1. Lecture 9 will cover the following topics:
    1. Fate of P in Agriculture
    2. P leaching and runoff
    3. Eutrophication

(Dr. Sartain will be the instructor for lectures 10-11)

Lecture 10: Potassium

1. Lecture 10 will cover the following topics:
    1. Functions, soil sources and materials
2. Read textbook pgs.
3. Complete Problem Set 4

Lecture 11: Potassium

1. Lecture 11 will cover the following topic:
    1. Reactions of K fertilizers with soil
2. **Complete Module II Exam**

(Dr. Daroub will be the instructor for lectures 12-15)

Lecture 12: Calcium

1. Lecture 12 will cover the following topics:
    1. Soil Acidity and liming
    2. Effects of lime and calcium on soils

Lecture 13: Sulfur

1. Lecture 13 will cover the following topics:
    1. Sources, forms and reactions of S
    2. Environmental issues with sulfur

Lecture 14: Micronutrients

1. Lecture 14 will cover the following topics:
    1. General Cycle and reactions of micronutrients
    2. Micronutrient Fertilization

Lecture 15: Trace Elements

1. Lecture 15 will cover the following topics:
    1. Environmental issues with trace elements
2. **Complete Module III Exam**