

COURSE INFORMATION - Spring Semester, 1998 (SYLLABUS)

TITLE: Soils (PL S 2)

INSTRUCTOR: Dr. Donald (Don) Grimes, Water Scientist Emeritus, U.C., Davis (Kearney Agricultural Center).

Office hours: Generally, 1/2 to 1 hour before class in LH. Other times by prior arrangement. Students may contact the instructor by calling the Kearney Agricultural Center (646-6500) or at home (638-9987).

COURSE DESCRIPTION: An introduction to the basic principles of soil science that includes the physical, chemical, and biological characteristics of soils. Soil properties are related to the individual factors of formation that are geologic parent materials, vegetation, climate, relief, and time. A major emphasis is placed on developing practical and effective present-day soil management solutions that preserve soil quality in an irrigated environment.

UNITS & HOURS: 3 Units; 2 hours lecture - M,W 1:00 p.m. to 1:50 a.m. LH 1
 (1461) 3 hours lab. - W 2:00 p.m. to 4:50 p.m. LH 1
 (1460) " F 10:00 a.m. to 12:50 p.m. LH 1

NO CLASS: Holiday - Martin Luther King Day; Monday, January 19, 1998
 " - Lincoln's Day; Friday, February 13, 1998
 " - Washington's Day; Monday, February 16, 1998
 Spring Recess - Monday through Friday; April 6 - 10, 1998

LAST DAY TO: Drop class with refund; Friday, January 23, 1998
 Drop without transcript record; Friday, January 30, 1998
 Change to CR/NC; Tuesday, February 17, 1998
 Drop without a letter grade assigned; Friday, March 13, 1998

FINAL EXAM WEEK: M - F, May 18 - 22, 1998

COURSE FINAL EXAM: W, May 20, 1998, 1:00 p.m.; LH 1

TEXTBOOK: Fundamentals of Soil Science, Henry D. Foth.

COURSE OBJECTIVES:

To develop an understanding of the importance of soil in the lithosphere.

To be able to define and distinguish between the important physical properties of a mineral soil, such as: soil origin, taxonomy, soil profile, texture, minerals, organic matter, soil air, soil water, soil structure, measurements of density, soil color, soil temperature, and soil tilth.

To evaluate the interrelationship of mineral soil, water, and plants, especially those affecting plant growth.

To identify the effects of soil reaction on plant growth and soil health.

To recite the micro and macro nutrients supplied by the soil to plants.

To demonstrate the interrelationships of soil nutrition, especially nitrogen, upon plants, soil organisms, soil air, soil water, and soil mineral matter.

ASSIGNMENTS/GRADING: The final course grade will be determined from point accumulation from quizzes, midterm exams, laboratory exercises, and a final examination. The approximate contribution of each activity is :

Quizzes (7):	10	(percent)
Midterms (2):	36	"
Laboratory Exercises:	27	"
Final Examination	27	"

A Ranch Report (optional) may be completed for extra credit if the student desires.

All written essay work completed outside of class lecture or laboratory time should be typed and double-spaced.

Laboratory assignments are generally due at the end of the laboratory period. Some exceptions are made necessary by activities that require extra time such as soil drying.

Late laboratory assignments turned in within one week of the required due date will be accepted with a penalty equal to 1/3 of the maximum points. Any lab assignment turned in after that time up to the last regular class meeting will be accepted with a 50% penalty.

Attendance of lectures and labs is required and roll will be taken at each meeting. A "tardy" is considered an absence unless the student contacts the instructor at the end of class to have the status changed to a tardy. Excessive absences can become a deciding factor in all "borderline" grades. Students must make prior arrangements with the instructor to be excused from labs. and make-up's are permitted only with an excused absence.

Tests - Makeup actions for any examination will be limited to students who have made arrangements with the instructor prior to the required testing period or who have been excused by the Dean of Admissions.

Generally, no makeup will be permitted for quizzes. Students who know they will be absent from class when a quiz has been announced should arrange to take the quiz early.

A letter grade will be assigned based on total point accumulation during the course of the semester. With minor exceptions, course grades will generally be assigned as: 90 to 100 % = A; 80 to 90% = B; 70 to 80% = C; 60 to 70% = D; <60% = F.

COURSE OUTLINE

Section 1.

A. Soil as a medium for plant growth.

1. Factors of plant growth.
2. Plant roots and soil relations.
3. Soil fertility and soil productivity.

B. Soil as a natural body.

1. Soil Parent material.
2. Soil formation.
3. Soils as natural bodies.

C. Soil physical properties.

1. Soil texture.
2. Soil structure.
3. Soil consistence.
4. Density and weight relationships.
5. Soil pore space and porosity.
6. Soil color.
7. Soil temperature.

D. Tillage and traffic.

1. Effects of tillage on soils and plant growth.
2. Traffic and soil compaction.
3. Flooding and puddling of soil.

-Midterm exam-

Section 2.

E. Soil water.

1. Soil water energy continuum.
2. Energy and pressure relationships.
3. The soil water potential.
4. Soil water movement.
5. Plant and soil water relations.
6. Soil water regime.

F. Soil water management.

1. Water conservation.
2. Soil drainage.
3. Irrigation.
4. Rate and timing of irrigation.
5. Water quality.
6. Salt accumulation and plant response.
7. Salinity control and leaching requirement.
8. Effect of irrigation on river water quality.
9. Nature and management of saline and sodic soils.

G. Soil Erosion.

1. Water erosion
2. Wind erosion.

H. Soil organic matter.

1. The organic matter in ecosystems.
2. Decomposition and accumulation.
3. Organic soils.
4. The equilibrium concept.
5. Horticultural use of organic matter.

-Midterm exam-

Section 3.

I. Nutrients.

1. Soil mineralogy.
2. Soil chemistry.
3. Plant-soil macronutrient relations.
4. Micronutrients and toxic elements.

J. Fertilizers.

1. Fertilizer terminology.
2. Fertilizer materials.
3. Mixed fertilizers.
4. Natural fertilizer materials.
5. Fertilizer management.

K. Soil genesis and classification.

1. Role of soil forming factors in soil genesis.
2. Diagnostic surface and subsurface soil horizons.