SOIL 304 - TROPICAL SOILS

COURSE DESCRIPTION:

Origin, development, properties, classification, use, and management of soils with emphasis on applications in the tropics. Pre Chem 124 or consent of instructor.

COURSE PURPOSE:

One of the greatest challenges of this and future generations will be to develop and implement soil, crop, and nutrient management technologies that enhance plant productivity and the quality of our soil, water, and air. If we do not improve and/or sustain the productive capacity of our fragile soils, we will be unable to meet the food and fiber demand of our growing population. To meet this challenge, educators must engage students to develop qualitative and quantitative skills necessary to understand and manipulate chemical, biological, and physical properties and interrelationships in the soil, plant, atmosphere continuum that influence and control nutrient availability.

COURSE OBJECTIVES:

1. To learn the basic physical, chemical, and biological properties of soils, their origin and subsequent development with special attention to tropical soils.

2. To become aware of man's impact on soil resources through utilization and to understand the basic concepts involved in their management for continued productivity and conservation.

3. To provide hands-on exposure to the common methods of soil analysis and characterization in the laboratory.

Each student who successfully completes the course should have a practical understanding of the following:

• Properties common to most soils;
• Vocabulary to communicate with others in soil science and management;
• Different soil management strategies for different soils;
• Problem solving skills and analyses used to manage soils effectively;
• Appreciation for the importance of soils in agriculture, environment and our daily life.

Aspects of all these topics relate to the use of soil to support food production, natural resource management, and waste disposal.

INSTRUCTOR: Dr. Bruce W. Mathews, CAB 108, phone 933-0853, bmathews@hawaii.edu


REFERENCES: http://www.nrcs.usda.gov/

http://www.hi.nrcs.usda.gov/


**GRADING:**

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<thead>
<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>100</td>
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<td>Exam 2</td>
<td>100</td>
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<td>Exam 3</td>
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<tr>
<td>CCA Soil Fundamentals Exam</td>
<td>100</td>
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<tr>
<td>Lab assign./problem sets†</td>
<td>100</td>
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<tr>
<td><strong>Total possible</strong></td>
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450 or more (≥ 90%) = A  
400-449 (80 - 89%) = B  
350-399 (70 - 79%) = C  
300-349 (60 - 69%) = D  
299 or less (< 59%) = F

† Assignments turned in one class period late will be docked 20%. Assignments turned in one week late (or thereafter) will be docked 40%.

**ATTENDANCE:**  Class attendance is expected. The student is responsible for all materials presented in the CLASS.

Any student with a documented disability who would like to request for accommodations should contact the University Disability Services Office (Voice: 933-0816 or TTY: 933-3334, shirachi@hawaii.edu, Campus Center Room 311), as early in the semester as possible.

Advising is a very important resource designed to help students complete the requirements of the University and their individual majors. Students should consult with their advisor at least once a semester to decide on courses, check progress towards graduation, and discuss career options and other educational opportunities provided by UH-Hilo. Advising is a shared responsibility, but students have final responsibility for meeting degree requirements.
TROPICAL SOILS - COURSE OUTLINE

**Topics**

1. Rocks to Soil (read text chapter 1)
2. Particles, Structures and Water (read text chapter 2)
3. Review for Exam 1
4. Soil Survey, Classification and Evaluation (read text chapter 5 and handouts)
5. Soil Surfaces, Acidity and Nutrients (read text chapter 3)
6. Review for Exam 2
7. Soil Microbes and Nutrient Cycling (read text chapter 4)
8. Soils and Agriculture - Fertility Management (read text chapter 6 and handouts)
9. Review for Exam 3
10. Soil Contamination and Erosion (read text chapter 7)
11. Review for CCA Soil Practice Exam (Final)

TROPICAL SOILS LABORATORY

1. Soil Survey and Classification
2. Soil Texture
3. Bulk Density and Total Pore Space
4. Particle Size Analysis
5. Soil pH and Lime Requirement
6. Soil Organic Matter
7. Extractable Phosphorus
8. Exchangeable Cations
9. Extractable Inorganic N
10. Hawaii Island Soils Field Trip