



CC APPROVAL: 09/29/2015  
ACADEMIC SENATE APPROVAL: 10/28/2015  
BOT APPROVAL: 11/09/2015  
STATE ID: CCC000526035  
EFFECTIVE TERM: Fall 2016

## College of the Sequoias Course Outline of Record

**SUBJECT AREA AND COURSE NUMBER:** AG 004

**COURSE TITLE:** SOIL SCIENCE

**UNITS/HOURS**

**Units:** 3

**Hours:**

**Lecture Hours Per Week:** 3

**Lab Hours Per Week:** 1

**Total Lecture Hours Per Semester:** 52.5

**Total Lab Hours Per Semester:** 17.5

**Activity Hours Per Week:**

**Total Activity Hours Per Semester:**

**Total Hours Per Week:** 4

**Total Contact Hours Per Semester:** 70

**TOP CODE:** 0103.00 - Plant Science\*

**SAM CODE:** Clearly Occupational

**Cross-Listed Courses:**

**CATALOG COURSE DESCRIPTION:**

This is an agricultural science course that provides basic knowledge of the physical, chemical and biological properties of soil. It includes soil-forming factors, plant-soil-water relationships, soil pH and salinity, plant nutrition, fertilizers, and soil conservation.

**REQUISITES:**

NONE

**FIELD TRIP REQUIREMENTS:** Not Required

**GRADING:** S - Standard Grading A-F

**REPEATABLE:**

**TRANSFERABLE:**

\*Pending Approval\* CSU BA Transferable (1-199 level)

YES

\*Pending Approval\* UC BA Transferable (1-99)

YES

**METHODS OF INSTRUCTION:**

Methods of instruction may include, but are not limited to, the following:

\* Laboratory

- \* Lecture and/or Discussion
- \* Other (Specify)
- \*

Students will visit specific soil sites and evaluate soil types and classify soils according to their use.

## **METHODS OF EVALUATION:**

A student's grade will be based on multiple measures of performance unless the course requires no grade. Multiple measures may include, but are not limited to, the following:

- Skill demonstrations
- Problem solving assignments or activities
- Essay quizzes or exams
- Written essays or extended papers
- Multiple choice tests
- Short answer quizzes or exams
- Oral presentations
- Problem solving quizzes or exams

## **COURSE TOPICS:**

1. The soil around us
  - The function of soils in our ecosystem
  - Early agrarian societies and their soil management practices, including significant historical events
  - The soil as a natural body, an overview of its features and functions
  - The scientific aspects of soil science, applied research present and future
2. Formation of soils from parent materials
  - Parent rocks and the influence on soil
  - Factors influencing soil formation
  - Soil formation in action
3. Soil classification
  - Soil orders
  - Categories and nomenclature of soil taxonomy
  - Soil series and textural classes
  - Storie index and land capability classes
4. Soil physical properties
  - Texture
  - Structure
  - Color
  - pH
  - Profile
  - Bulk density
  - Particle density
  - Pore space
  - Soil management as applied to physical properties
5. Interpretation and use of soil maps
  - Remote sensing tools for soil investigations
  - Satellite imagery
  - County soil survey reports and their utilization
  - Geographic Information Systems (GIS)
6. Organic material and microbiology of soils
  - Influence of organic material in the soil complex
  - Composting
  - Diversity of soil organisms
  - Influence of soil microorganisms
  - The soil environment and organisms and organic matter
  - Soil nutrient cycles
  - Concept of a sustainable soil system
7. Soil moisture
  - The hydrological cycle
  - The soil plant atmosphere continuum
  - Relation to texture, structure, and organic material in the soil
  - Retention and movement in the soil
  - Soil drainage
  - Irrigation requirements and practices in relation to soil
  - Water quality influence and assessment
  - Water conservation applications
8. Soil colloids

- Properties and type of colloids
  - Genesis of soil colloids
  - Cation exchange capacity
  - Factors influencing the availability of micronutrient cations and anions
  - Soil analysis
9. Soil pH
- Assessment
  - Management of acidic soils
  - Management and reclamation of saline-alkaline soils
  - Global soil quality as affected by human activities

## **OUTCOMES:**

### **Course Objectives**

The main concepts for this course will ask students to...

1. Analyze local soil quality as affected by human and natural activities.
2. Explain local geographical features and their relationship to local soils.
3. Evaluate parent rocks and other soil forming processes influence on local and global soils.
4. Demonstrate the determination of the following soil physical properties: textures (two methods), use of texture triangle, bulk density, particle density, pore space, organic content, color, pH, structure, conductivity and reactivity.
5. Demonstrate an understanding of the classification of local and global soil orders (i.e., soil taxonomy).
6. Discuss and understand the importance of essential plant nutrients.
7. Apply soil nutrient cycles to soil, plant, and soil organism relationships.
8. Demonstrate an ability to use appropriate terminology professionally when discussing soils.
9. Demonstrate practical soil management including soil conservation and sustainability.
10. Analyze a soil's microbiological activity level.
11. Demonstrate an understanding of a soil food web.
12. Demonstrate how to read a soil map, explain the importance of soil mapping and how to locate a specific site using both township/range and GIS (Geographic Information Systems).
13. Demonstrate how to determine a Soil Storie Index Rating and a Natural Resources Conservation Service land capability class.
14. Describe the organic breakdown cycle of a soil and the role of organisms in soil physical and chemical properties.
15. Evaluate a soil's water holding capacity, plant available water, properties and movement of water in soil.

## **Assignments**

### **Reading:**

Students will read a chapter related to soil surveys and summarize the steps to access a county soil survey online.

### **Writing:**

After testing for soil nutrients, students will write a recommendation to amend a parcel of soil based on the soil test results.

### **Homework:**

Read and summarize the safety guidelines for the soils laboratory.

### **Lab Content:**

Categories and nomenclature of soil taxonomy

Particle Size distribution

Soil Structure, Texture, Color

Interpretation and usage of soil maps

Organic materials and micro biology of soils

Soil Moisture

Soil Analysis and Management

Soil Ecosystems

Soil Chemistry

## **TEXTS AND SUPPLIES:**

Textbooks may include, but are not limited to:

**TEXTBOOKS:**

1. Edward Plaster. Soil Science and Management, 6th ed. Cengage Learning, 2013, ISBN: 978-0840024329

**MANUALS:**

**PERIODICALS:**

**MATERIALS FEE:** NO

**OTHER:**

**SLO:** <http://cos.edu/CO318>

[outcomes](#)

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