

Discipline: Agriculture	Sub-discipline: Plant Science
General Course Title: Introduction to Soil Science	Min. Units: 3 Semester
Proposed Suffix: L	
<p>Course Description: The study of soil derivation, classification, and characteristics. Soil use and management including erosion, moisture retention, structure, cultivation, organic matter and microbiology. Laboratory topics include soil type, classification, soil reaction, soil fertility and physical properties of soil. Laboratory required.</p>	
Required Prerequisites or Co-Requisites ¹	
Advisories/Recommended Preparation ²	
<p>Course Objectives: <i>At the conclusion of this course, the student should be able to:</i></p> <ul style="list-style-type: none"> • Analyze local soil quality as affected by human and natural activities. • Explain local geographical features and their relationship to local soils. • Evaluate parent rocks and other soil forming processes influence on local and global soils. • 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. • Demonstrate an understanding of the classification of local and global soil orders (i.e., soil taxonomy). • Discuss and understand the importance of essential plant nutrients. • Apply soil nutrient cycles to soil, plant, and soil organism relationships. • Demonstrate an ability to use appropriate terminology professionally when discussing soils. • Demonstrate practical soil management including soil conservation and sustainability. • Analyze a soil's microbiological activity level. • Demonstrate an understanding of a soil food web. • Describe the 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). • Demonstrate how to determine a Soil Storie Index Rating and a Natural Resources Conservation Service land capability class. • Describe the organic breakdown cycle of a soil and the role of organisms in soil physical and chemical properties. • Evaluate a soil's water holding capacity, plant available water, properties and movement of water in soil. 	
<p>Course Content:</p> <ol style="list-style-type: none"> 1. The soil around us <ol style="list-style-type: none"> A. The function of soils in our ecosystem B. Early agrarian societies and their soil management practices, including significant historical events C. The soil as a natural body, an overview of its features and functions D. The scientific aspects of soil science, applied research present and future <p>Introduction to Soil Science (Content Continued)</p>	

¹ Prerequisite or co-requisite course need to be validated at the CCC level in accordance with Title 5 regulations; co-requisites for CCCs are the linked courses that must be taken at the same time as the primary or target course.

² Advisories or recommended preparation will not require validation but are recommendations to be considered by the student prior to enrolling.

2. Formation of soils from parent materials
 - A. Parent rocks and the influence on soil
 - B. Factors influencing soil formation
 - C. Soil formation in action

3. Soil classification
 - A. Soil orders
 - B. Categories and nomenclature of soil taxonomy
 - C. Soil series and textural classes
 - D. Storie index and land capability classes

4. Soil physical properties
 - A. Texture
 - B. Structure
 - C. Color
 - D. pH
 - E. Profile
 - F. Bulk density
 - G. Particle density
 - H. Pore space
 - I. Soil management as applied to physical properties

5. Interpretation and use of soil maps
 - A. Remote sensing tools for soil investigations
 - B. Satellite imagery
 - C. County soil survey reports and their utilization
 - D. Geographic Information Systems (GIS)

6. Organic material and microbiology of soils
 - A. Influence of organic material in the soil complex
 - B. Composting
 - C. Diversity of soil organisms
 - D. Influence of soil microorganisms
 - E. The soil environment and organisms and organic matter
 - F. Soil nutrient cycles
 - G. Concept of a sustainable soil system

7. Soil moisture
 - A. The hydrological cycle
 - B. The soil plant atmosphere continuum
 - C. Relation to texture, structure, and organic material in the soil
 - D. Retention and movement in the soil
 - E. Soil drainage
 - F. Irrigation requirements and practices in relation to soil
 - G. Water quality influence and assessment
 - H. Water conservation applications

**Introduction to Soil Science
(Content Continued)**

8. Soil colloids
 - A. Properties and type of colloids

<ul style="list-style-type: none"> B. Genesis of soil colloids C. Cation exchange capacity D. Factors influencing the availability of micronutrient cations and anions E. Soil analysis <p>9. Soil pH</p> <ul style="list-style-type: none"> A. Assessment B. Management of acidic soils C. Management and reclamation of saline-alkaline soils D. Global soil quality as affected by human activities <p>Laboratory Activities: Individual Laboratory Activities are designed to support course objectives.</p>	
<p>Methods of Evaluation: Lecture Comprehensive Quizzes and Exams Written Critical Thinking Scenarios Problem Analysis and Solution Research and Term Papers</p>	<p>Methods of Evaluation: Laboratory Laboratory Skill Validation by Observation Laboratory Reports Laboratory Research Projects and Reports Laboratory Skill Practicum Exams</p>
<p>Typical Textbooks, Manuals, or Other Support Materials</p> <p style="padding-left: 40px;"><u>Soil Science and Management</u>, Edward J. Plaster, 3rd Edition, Delmar Publishers, 1997</p> <p style="padding-left: 40px;"><u>The Nature and Property of Soils</u>, Brady and Weil, 13th Edition, Prentice Hall, 2002</p>	
<p>CSU GE Area B.1 Physical Sciences</p>	
<p>Statewide Articulation: CPSLO-SS 121, CPP-PLT 231/L, CSUF-SW 1, CSUC-PSSC 250, others as lower division elective</p>	
<p>FDRG Lead Signature: _____ Date: _____</p>	
<p>Mark E. Bender, PhD CSU Stanislaus</p>	
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