



AG 004: SOIL SCIENCE

Proposer:**Name:**

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Effective Term:

Fall 2022

Credit Status:

Credit - Degree Applicable

Subject:

AG - Agriculture

Course Number:

004

Catalog Title

Soil Science

Catalog 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.

Advisory on Recommended Preparation:

PLSI 001 or equivalent college course with a minimum grade of C.

Method of Instruction:

Laboratory

Lecture and/or Discussion

Course Units/Hours:**Course Units Minimum:**

3

Lecture Hours Minimum (week)

3

Lab Hours Minimum (week)

1

Activity Hours Minimum (week)

0

Total Contact Hours Minimum (semester)

70

Total Outside Hours Minimum (semester)

105

Total Student Learning Minimum Hours (semester)

175

Repeatability:

No

Open Entry/Exit:

No

Field Trips:

Not Required

Grade Mode:

Standard Letter

TOP Code:

010300 - * Plant Science

SAM Code:

C - Clearly Occupational

Course Content

Methods of Assessment:

Multitple choice tests
 Problem solving assignments or activities
 Problem solving quizzes or exams
 Short answer quizzes or exams
 Skill demonstrations

Course Topics:

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, storic 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.

Course Objectives:

Course Objectives	
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.
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 soils 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 soils water holding capacity, plant available water, properties and movement of water in soil.

Course Outcomes:

Course Outcomes	
1	Soil Sampling: Students will collect and prepare soil samples to be tested for chemical and physical properties.
2	Soil Testing: Students will test a soil sample to determine soil texture, pH, water holding capacity and salinity.

Assignments:

Assignment Type:	Details
Reading	Students will access and read a county soil survey in order to respond to a series of questions related to the soils included in the survey.
Writing	As part of a lab, students will write a set of notes describing the function or purpose, and safety protocol or proper use of the primary equipment and glassware needed to conduct the laboratory activities to test a soil sample for pH, texture, water holding capacity and conductivity.
Homework	Students will read a set of laboratory safety guidelines and take a quiz on the safety guidelines and procedures to follow during the lab activities for the class.
Lab	As part of a lab, students will collect a soil sample and prepare the sample to be tested for pH, texture, water holding capacity and conductivity.

Textbooks or other support materials

Resource Type:	Details
Books	Soil Science and Management, 6th Edition. Edward Plaster, Cengage Learning, 2014. ISBN-13: 9780840024329. No new edition available.
Books	Elements of the Nature and Properties of Soils, 4th Edition. Nyle C. Brady, Raymond R. Weil, Ray R. Weil, Pearson, 2019. ISBN-13: 978-0133254594.
Manuals	Western Region Certified Crop Advisor Examination Study Guide prepared by T.K. Hartz Department of Plant Sciences University of California- Davis Revised June, 2017.
Web/Other	United States Department of Agriculture Natural Resources Conservation Service website. https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/

Transferable to CSU

Yes - Approved

CSU General Education

CSU GE B3: Laboratory Activity

CSU GE B1: Physical Science

Transferable to CSU

This course will also be proposed for UC transfer.

No

Transferable to UC

Yes - Approved



UC/IGETC General Education

Transferable to UC

COS General Education

COS GE B: Natural Sciences

Other Degree Attributes

Degree Applicable

Not a Basic Skills Course

Banner Title:

Soil Science

Curriculum Committee Approval Date:

03/09/2022

Academic Senate Approval Date:

03/23/2022

District Governing Board Approval Date:

04/18/2022

Course Control Number:

CCC000526035

C-ID:

AG-PS128L