

Course Outline of Record

1. Course Code: AGPS-001
2. a. Long Course Title: Soils & Plant Nutrition
 b. Short Course Title: SOILS/PLANT NUTRTION
3. a. Catalog Course Description:
 This lecture and laboratory course covers soil derivation, classification, texture, structure, water movement and measurement, organic matter, microorganisms, sampling techniques, pH, salinity, reclamation and tillage. Also included are soil survey reports and maps, basic soil chemistry, essential plant nutrients, soil analysis, and fertilizers.
 b. Class Schedule Course Description:
 This lecture and laboratory course covers soil derivation, classification, texture, structure, water movement and measurement, organic matter, microorganisms, sampling techniques, pH, salinity, reclamation and tillage.
 c. Semester Cycle (if applicable): N/A
 d. Name of Approved Program(s):
 - ENVIRONMENTAL HORTICULTURE AS Degree and Transfer Preparation
 - ENVIRONMENTAL HORTICULTURE AS Degree for Employment Preparation
 - ENVIRONMENTAL HORTICULTURE Certificate of Achievement
 - TURFGRASS MANAGEMENT AS Degree for Employment Preparation
 - TURFGRASS MANAGEMENT Certificate of Achievement
4. Total Units: 4.00 Total Semester Hrs: 108.00
 Lecture Units: 3 Semester Lecture Hrs: 54.00
 Lab Units: 1 Semester Lab Hrs: 54.00
 Class Size Maximum: 26 Allow Audit: No
 Repeatability No Repeats Allowed
 Justification 0
5. Prerequisite or Corequisite Courses or Advisories:
 Course with requisite(s) and/or advisory is required to complete Content Review Matrix (CCForm1-A)
 Advisory: MATH 060
6. Textbooks, Required Reading or Software: (List in APA or MLA format.)
 a. Plaster, E. (2010). Soils and Plant Nutrition (Revised/e). Clifton Park, NY Delmar Learning/Thomson Learning, Inc.. ISBN: -
 College Level: Yes
 Flesch-Kincaid reading level: 11.8
7. Entrance Skills: *Before entering the course students must be able:*
 a.
 Apply the basic operations appropriately to solve application problems that involve their use.
 - MATH 060 - Compute using the four basic operations of addition, subtraction, multiplication, and division on the rational numbers in both fraction and decimal form.
 - MATH 060 - Apply methods of conversion between percents, decimals, and fractions.
 - MATH 060 - Recognize and convert between units of measurements in the American and metric systems.
 - MATH 060 - Use unit measure appropriately in applications.
8. Course Content and Scope:

Lecture:

1. The soil around us
 1. The function of soils in our ecosystem
 2. Early agrarian societies and their soil management practices, including significant historical events
 3. The soil as a natural body, an overview of its features and functions
 4. The scientific aspects of soil science, applied research present and future

1. Formation of soils from parent materials
 - A. Parent rocks and the influence on soil
 - B. Factors influencing soil formation
 - C. Soil formation in action
1. 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
1. 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
1. 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)
1. 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
1. 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
 - 1. Soil colloids
 - A. Properties and type of colloids
 - B. Genesis of soil colloids
 - C. Cation exchange capacity
 - D. Factors influencing the availability of micronutrient cations and anions
- E. Soil analysis
 - 1. Soil pH
 - A. Assessment
 - B. Management of acidic soils
 - C. Management and reclamation of saline-alkaline soils
 - D. Global soil quality as affected by human activities

Laboratory Activities

Individual Laboratory Activities may include but are not limited to:

- 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

Lab: (if the "Lab Hours" is greater than zero this is required)

- a. A familiarity with basic laboratory equipment i.e. balances, glassware.
- b. Soil surveying of local soil series
- c. Experiments with fertilizer deficiencies in common horticultural crops
- d. Texture analysis by several laboratory procedures
- e. A study of soil micro-organisms
- f. Water relationship with different soils i.e. soil moisture, capillary action and infiltration
- g. Soil sampling, testing, and analysis
- h. C.E.C. interpretation and soil fertility
- i. Fertilizer programs for different local horticultural crops
- j. Class presentations of various soil topics

9. Course Student Learning Outcomes:

1.
Identify the various soil separates and soil series found in the local desert environment.
2.
Demonstrate various methods of testing soil samples to then develop recommendations for soil modification or enhancement.
3.
Demonstrate practical soil management.

10. Course Objectives: *Upon completion of this course, students will be able to:*

- a. • 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.

11. Methods of Instruction: (*Integration: Elements should validate parallel course outline elements*)

- a. Demonstration, Repetition/Practice
- b. Discussion
- c. Experiential

- d. Lecture
- e. Observation
- f. Participation

Other Methods:

interpret text and provide scientific proof of concepts Reading assignments – with end of chapter reviews to demonstrate student comprehension of text Student participation in lab exercises – demonstrates clarity of concept and understanding of scientific method Students will have opportunities to work as partners and in small groups Some sessions will involve field observations and exercises

12. Assignments: *(List samples of specific activities/assignments students are expected to complete both in and outside of class.)*

In Class Hours: 108.00

Outside Class Hours: 108.00

a. In-class Assignments

- a. Reading and writing on lab exercises and reports
- b. Develop writing responses to questions designed to stimulate problem solving approaches
- c. Presentation of lab analysis to class
- d. Evaluate effectiveness of laboratory procedure by laboratory exercise outcome
- e. Conduct soil analysis and soil profile in field.

b. Out-of-class Assignments

- a. Read assigned chapters in textbook

13. Methods of Evaluating Student Progress: *The student will demonstrate proficiency by:*

- Written homework
- Term or research papers
- Laboratory projects
- Presentations/student demonstration observations
- True/false/multiple choice examinations
- Mid-term and final evaluations
- Student participation/contribution
- Student preparation
- Other

Lab reports are required

14. Methods of Evaluating: Additional Assessment Information:

15. Need/Purpose/Rationale -- *All courses must meet one or more CCC missions.*

PO - Career and Technical Education

Fulfill the requirements for an entry- level position in their field.

Apply critical thinking skills to execute daily duties in their area of employment.

Apply critical thinking skills to research, evaluate, analyze, and synthesize information.

Display the skills and aptitude necessary to pass certification exams in their field.

Exhibit effective written, oral communication and interpersonal skills.

Transfer to a higher level learning institution

IO - Personal and Professional Development

Self-evaluate knowledge, skills, and abilities.

IO - Scientific Inquiry

Identify components of the scientific method.

Collect and analyze data. Skills of data collection include an understanding of the notion of hypothesis testing and specific methods of inquiry such as experimentation and systematic observation.

Predict outcomes utilizing scientific inquiry: using evidence and assertions determine which conclusions logically follow from a body of quantitative and qualitative data.

Analyze quantitative and qualitative information to make decisions, judgments, and pose questions.

16. Comparable Transfer Course

University System	Campus	Course Number	Course Title	Catalog Year
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17. Special Materials and/or Equipment Required of Students:

18. Materials Fees: Required Material?

Material or Item	Cost Per Unit	Total Cost
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19. Provide Reasons for the Substantial Modifications or New Course:

Remove English 70 advisory

20. a. Cross-Listed Course (*Enter Course Code*): *N/A*
 b. Replacement Course (*Enter original Course Code*): *N/A*

21. Grading Method (*choose one*): Letter Grade Only

22. MIS Course Data Elements

- a. Course Control Number [CB00]: CCC000256971
- b. T.O.P. Code [CB03]: 10300.00 - Plant Science
- c. Credit Status [CB04]: D - Credit - Degree Applicable
- d. Course Transfer Status [CB05]: A = Transfer to UC, CSU
- e. Basic Skills Status [CB08]: 2N = Not basic skills course
- f. Vocational Status [CB09]: Possibly Occupational
- g. Course Classification [CB11]: Y - Credit Course
- h. Special Class Status [CB13]: N - Not Special
- i. Course CAN Code [CB14]: *N/A*
- j. Course Prior to College Level [CB21]: Y = Not Applicable
- k. Course Noncredit Category [CB22]: Y - Not Applicable
- l. Funding Agency Category [CB23]: Y = Not Applicable
- m. Program Status [CB24]: 1 = Program Applicable

Name of Approved Program (*if program-applicable*): ENVIRONMENTAL HORTICULTURE,ENVIRONMENTAL HORTICULTURE,ENVIRONMENTAL HORTICULTURE,TURFGRASS MANAGEMENT,TURFGRASS MANAGEMENT

Attach listings of Degree and/or Certificate Programs showing this course as a required or a restricted elective.)

23. Enrollment - Estimate Enrollment

First Year: 26
 Third Year: 26

24. Resources - Faculty - Discipline and Other Qualifications:

- a. Sufficient Faculty Resources: Yes
- b. If No, list number of FTE needed to offer this course: *N/A*

25. Additional Equipment and/or Supplies Needed and Source of Funding.

N/A

26. Additional Construction or Modification of Existing Classroom Space Needed. (*Explain:*)

N/A

27. FOR NEW OR SUBSTANTIALLY MODIFIED COURSES

Library and/or Learning Resources Present in the Collection are Sufficient to Meet the Need of the Students Enrolled in the

AGPS 001-Soils & Plant Nutrition

Course: Yes

28. Originator Eddie Vaca Origination Date 10/27/17
