**BARTON COMMUNITY COLLEGE**

**COURSE SYLLABUS**

1. **GENERAL COURSE INFORMATION**

Course Number: AGRI 1115

Course Title: Introduction to Soils

Credit Hours: 5

Prerequisites: AGRI 1114 Plant Science or LIFE 1402 Principles of Biology

Division/Discipline: Workforce Training & Community Education/ Agriculture Business Management, Crop Protection

Course Description: This course is an overview of the physical, chemical, and biological processes involved in the formation, classification, distribution, behavior, and management, and ecology of soils.

1. **INSTRUCTOR INFORMATION**
2. **COLLEGE POLICIES**

Students and faculty of Barton Community College constitute a special community engaged in the process of education. The College assumes that its students and faculty will demonstrate a code of personal honor that is based upon courtesy, integrity, common sense, and respect for others both within and outside the classroom.

Plagiarism on any academic endeavors at Barton Community College will not be tolerated. The student is responsible for learning the rules of, and avoiding instances of, intentional or unintentional plagiarism. Information about academic integrity is located in the Student Handbook.

The College reserves the right to suspend a student for conduct that is determined to be detrimental to the College educational endeavors as outlined in the College Catalog, Student Handbook, and College Policy & Procedure Manual. (Most up-to-date documents are available on the College webpage).

Any student seeking an accommodation under the provisions of the Americans with Disability Act (ADA) is to notify Student Support Services via email at [disabilityservices@bartonccc.edu](mailto:disabilityservices@bartonccc.edu).

1. **COURSE AS VIEWED IN THE TOTAL CURRICULUM**

A practical understanding of the fundamental principles of soil science is critical for students preparing to work in any aspect of production agriculture. This understanding not only helps students integrate concepts from the total agriculture curriculum, but provides the necessary background to effectively apply these concepts in a practical and environmentally sound manner.

1. **ASSESSMENT OF STUDENT LEARNING**

Barton Community College is committed to the assessment of student learning and to quality education. Assessment activities provide a means to develop an understanding of how students learn, what they know, and what they can do with their knowledge. Results from these various activities guide Barton, as a learning college, in finding ways to improve student learning.

Course Outcomes, Competencies, and Supplemental Competencies:

1. Identify and explain the role of soils in the environment.
2. List and define terms and concepts.
3. Soils and their role in the environment.
4. Soil profile.
5. Soil organic and inorganic soil constituents.
6. Soils as a plant growth medium.
7. Outline the processes involved in soil formation and their interactions.
8. List and define the five factors of soil formation.
9. Explain the interaction of the five factors of soil formation.
10. Summarize the basic factors of and be able to describe soil classification.
11. Describe soil taxonomy and its levels of classification.
12. Define soil order and its relevance to agriculture.
13. List and describe the soil orders found in the continental U.S.
14. Define the components of soil mapping and soil surveys.
15. Outline the concepts of soil texture, architecture, water, hydrology, aeration, and temperature, their interrelationship, and importance to the soil environment.
16. Define soil color, texture and textural classes.
17. Explain soil structure formation, structural categories and management effects of soil structure.
18. List and define the characteristics and behavior of soil water.
19. Explain the hydrologic cycle, its components, and the soil-plant-atmosphere continuum.
20. Describe the effects of soil aeration on soil chemical and biological properties.
21. Explain the effects of soil temperature on soil processes.
22. Categorize the chemical and physical properties of the colloidal fraction in soils.
23. List and define the types of soil colloids and their properties.
24. Describe the source of soil colloid charges and their effects on soil physical, chemical, and biological properties.
25. Define the terms and laws involved in cation and anion exchange reactions.
26. Describe basic soil chemical properties in relation to the soil physical and chemical environment.
27. Explain the following terms: pH, acidity, alkalinity, and buffering capacity.
28. Describe the general properties of water and their impact on soil properties.
29. Define soil acidity, alkalinity, aridity, salinity and their effects on soil properties, the soil environment, and soil management.
30. Describe the soil biological environment and its importance to overall ecology.
31. List and define the types of living organisms found in soil and their impact on the soil environment.
32. Explain the interaction of soil organisms with their environment and higher plant life.
33. Describe the components of the global carbon cycle.
34. Define soil organic matter, organic carbon, and humus.
35. List and explain the process of soil organic matter decomposition and its role in the soil environment.
36. List, define, and describe the essential soil nutrients and their management.
37. Define essential nutrient, macro- and micro- nutrient, and the elemental nutrients in each category.
38. List the roles of essential nutrients in higher plant life cycles.
39. List and describe the general mechanisms of the major nutrient cycles.
40. List and describe the sources of fertilizers.
41. Explain the difference between inorganic and organic fertilizers.
42. Describe commonly available forms of fertilizers, fertilizer application methods, and approaches to determining fertilizer amounts.
43. Explain the types of conventional soil tests and their use in crop production.
44. Describe the mechanisms, causes, and control of soil erosion.
45. Define types of soil erosion, natural and artificial soil erosion, and the effects of erosion on the soil and overall environment.
46. List and define the terms in the Universal Soil Loss Equations for water and wind erosion.
47. List and explain the factors affecting wind and water erosion.
48. Define conservation tillage, common conservation tillage systems and describe the advantages and disadvantages of each system.
49. Describe the methods available to control wind and water erosion in addition to conservation tillage.
50. **INSTRUCTOR’S EXPECTATIONS OF STUDENTS IN CLASS**
51. **TEXTBOOKS AND OTHER REQUIRED MATERIALS**
52. **REFERENCES**
53. **METHODS OF INSTRUCTION AND EVALUATION**
54. **ATTENDANCE REQUIREMENTS**
55. **COURSE OUTLINE**