



Western Technical College

## 10006173 Introduction to Soils

### Course Outcome Summary

#### Course Information

<b>Description</b>	Intro to Soils examines the fundamentals of soils physical properties, chemical properties, biological properties, soil formation, classification, essential nutrient and soil survey. There will be emphasis on soil and water conservation practices that can be used to reduce soil erosion. Participants will experience soils concepts through lab and in-the-field activities.
<b>Career Cluster</b>	Agriculture, Food and Natural Resources
<b>Instructional Level</b>	Associate Degree Courses
<b>Total Credits</b>	2
<b>Total Hours</b>	54

#### Textbooks

Open Education Resource: Soils Laboratory Manual. K-State Edition, Version 2.0. Moorberg, Colby J. and David A. Crouse. Required. <https://kstatelibraries.pressbooks.pub/soilslabmanual/front-matter/993/>

#### Success Abilities

1. Cultivate Passion: Expand a Growth-Mindset
2. Refine Professionalism: Improve Critical Thinking
3. Refine Professionalism: Participate Collaboratively
4. Refine Professionalism: Practice Effective Communication

#### Experiential Learning

1. Capstone Experience: in this course, you will develop a project that integrates and applies many of the concepts, skills, and characteristics needed of an industry expert in the field.

2. **Technology-Enhanced Learning:** this course will incorporate digital technologies like gamification, virtual reality experiences, or simulations. In addition, you will create technology-enhanced products such as ePortfolios, multimedia presentations, or other e-products to showcase your learning.
3. **Work-Based Learning:** this course applies your learning to your desired profession by working in industry placements such as internships, practicums, clinicals, or co-ops.

## **Program Outcomes**

1. Interact as a professional in Agribusiness
2. Investigate opportunities in Agribusiness
3. Apply relevant technologies
4. Apply economic and marketing strategies to Agribusiness Industry
5. Develop an Agribusiness Management Plan
6. Create a Crop Management Plan

## **Course Competencies**

### **1. Evaluate the physical properties of soil.**

#### **Assessment Strategies**

- 1.1. Project

#### **Criteria**

*You will know you are successful when*

- 1.1. you describe soil makeup.
- 1.2. you recognize components of healthy soil.
- 1.3. you summarize characteristics of soil properties.
- 1.4. you describe soil types of Wisconsin.

#### **Learning Objectives**

- 1.a. Classify soil components
- 1.b. Examine soil sample makeup
- 1.c. Compare and contrast soil types
- 1.d. Illustrate soil composition
- 1.e. Differentiate properties of soil across Wisconsin

### **2. Evaluate the chemical properties of soil.**

#### **Assessment Strategies**

- 2.1. Project

#### **Criteria**

*You will know you are successful when*

- 2.1. you name essential soil nutrients.
- 2.2. you classify nitrogen, phosphorus and potassium.
- 2.3. you explain the nitrogen cycle.
- 2.4. you identify secondary nutrients and trace elements.

#### **Learning Objectives**

- 2.a. Examine essential nutrients found in soils
- 2.b. Predict changes in soil due to chemical inputs
- 2.c. Determine primary, secondary, and trace elements in soils.

### **3. Evaluate the biological properties of soil.**

#### **Assessment Strategies**

- 3.1. Project

## Criteria

*You will know you are successful when*

- 3.1. you explain the functions of live organisms in the soil.
- 3.2. you characterize favorable conditions for biological growth in soil.
- 3.3. you describe soil fertility related organic matter.
- 3.4. you outline crop growth based on microbial functions in soil.
- 3.5. you express management options to increase organic matter.
- 3.6. you explain soil types in Wisconsin needing organic matter management.

## Learning Objectives

- 3.a. Interpret impacts of biological organisms in soil
- 3.b. Predict changes in soil due to biological inputs
- 3.c. Explore factors favoring biological activities in soil

## 4. Investigate soil water.

### Assessment Strategies

- 4.1. Report

### Criteria

*You will know you are successful when*

- 4.1. you generalize soil types related to water retainment.
- 4.2. you identify management options to retain soil water.
- 4.3. you identify characteristics of drier soil types.

### Learning Objectives

- 4.a. Discover water cycle impacts on soil
- 4.b. Interpret data on soil retaining water
- 4.c. Examine soil type ability to hold water
- 4.d. Characterize impacts of water on soil
- 4.e. Discuss soil water properties relating to crop growth
- 4.f. Predict water loss impacts on soil

## 5. Identify elements of soil management plans.

### Assessment Strategies

- 5.1. Report

### Criteria

*You will know you are successful when*

- 5.1. you review a soil test report.
- 5.2. you recognize areas to improve soil composition.
- 5.3. you identify management opportunities to change soil test reports.
- 5.4. you collect a soil sample to be processed.

### Learning Objectives

- 5.a. Predict soil test results based on physical observation of soil
- 5.b. Show the process of gathering a soil sample
- 5.c. Examine soil test reports for key soil traits
- 5.d. Infer impacts on crops based on soil deficiencies
- 5.e. Review management practices to improve soil test reports

## 6. Evaluate how wind and water contribute to soil erosion.

### Assessment Strategies

- 6.1. Activity
- 6.2. Project

### Criteria

*You will know you are successful when*

- 6.1. you describe management opportunities to prevent erosion.

- 6.2. you identify areas of concern that may be affected by erosion.
- 6.3. you compare and contrast erosion prevention methods.
- 6.4. you select appropriate methods to prevent erosion based on soil type and location.

**Learning Objectives**

- 6.a. Observe effects of soil erosion
- 6.b. Explore long-term impacts of erosion in agriculture
- 6.c. Discuss factors causing erosion
- 6.d. Examine opportunities to prevent soil erosion
- 6.e. Investigate soil erosion management in Wisconsin