



COURSE OUTLINE

<u>Course Number</u>	<u>Course Title</u>	<u>Credits</u>
OHT 108	Soil and Plant Nutrition	4
<u>Hours:</u> <u>Lecture/Lab/Other</u> 3/3/0	<u>Co- or Pre-requisite</u> None. Chemistry and Math Encouraged.	<u>sem/year</u> Spring 2021

Catalog Description:

Origins, composition, and physical and chemical properties of soils including ion exchange and pH effects; organic matter; soil-water relationships; nutrient deficiencies; and fertilizers. Lab work involves a number of representative soils to illustrate basic soil behavior.

Required Texts/Other Materials:

Textbook: Recommended
Title: Elements of the Nature and Properties of Soils,
Author: Brady and Weil
Publisher: Pearson/Prentice Hall

Study Guide: Optional
Title: Soil Science Simplified
Author: Helmut Kohnke & D.P. Franzmeier
Publisher: Waveland Press

Course Coordinator and Lab Instructor:

Amy Ricco, Professor
609-570-3372
riccoa@mccc.edu
MS124

Course Competencies/Goals

The student will be able to: (Gen-Ed Knowledge Goals 1 and 2; MCCC Core Skills Goals A, B, D and F)

1. Utilize the Scientific Method to carry on lab experiments that analyze representative soils from New Jersey and other areas of the United States.
2. Identify various soil structures and textures, and understand how the structure and texture relates to water availability and drainage, along with ventilation within a soil as it relates to plant growth.
3. Understand how soil is formed, and identify the factors involved in the rate of soil formation.

4. Identify the organisms found in soil, and describe their function in the formation of soil and in nutrient cycling.
5. Describe the function of the essential nutrients to plant growth, and identify both natural and synthetic sources of the named nutrients.
6. Understand chemical concepts as they relate to soil testing, soil pH, and soil amendments.
7. Describe the different types of soil erosion, and recognize their impacts.
8. Identify which soils are best suited for agriculture, waste disposal, and city planning.

This course is intended to provide you with a working knowledge of soil science in order to help you understand the practices used in the management of field and greenhouse soils.

The basic chemistry and physics of soil will be considered in sufficient scope and depth to facilitate the study of those areas in soil science which are most relevant to horticulture and plant science. Included in this will be a consideration of the relationship of soil structure to water storage and to plant growth, the role of soil and soil materials in plant nutrition, and the principles involved in soil liming and fertilization.

The laboratory portion of this course will illustrate and reinforce concepts presented during the lectures and will introduce the student to the basic techniques used in testing and altering the physical and chemical characteristics of soils.

Units of Study:

- Unit 1: An Introduction to Soil
Determining Soil Texture Using the Feel Method and Mathematical Calculations
Used in Soils
Readings: Chapter 1
- Unit 2: The Physical Properties of Soil Including Particle Size and Arrangement
Particle Size Distribution Using the Bouyoucos Hydrometer
Readings: Chapters 4, 7 and 8
- Unit 3: Soil Formation
Minerals, Rocks, and Weathering
Readings: Chapter 2
- Unit 4: Water Movement in Soil
Water Movement Lab
Readings: Chapter 5
- Unit 5: Water Management in Soil
Designing a Watershed
Readings: Chapter 6
- Unit 6: Organisms Found in Soil
Designing a Watershed
Readings: Chapter 10

Unit 7: Organic Matter; Decomposition and Biodegradation
Carbon and Nitrogen Cycling
Readings: Chapter 11

Midterm Exam

Unit 8: Nutrients in Soil
Nutrient Deficiency Lab Evaluation; Soil Testing for Nutrients
Readings: Chapters 12 and 13

Unit 9: Fertilizers
Nutrient Deficiency Lab Evaluation; Fertilizer Application
Readings: Chapter 14

Unit 10: Soil pH Including Acidity, Alkalinity and Salinity
Nutrient Deficiency Lab Evaluation; Determining Soil pH;
Amending Soil
Readings: Chapter 9

Unit 11: Soil Maps and Surveys/ Soil Taxonomy and Land Classification
Nutrient Deficiency Experiment Evaluation; Using Soil Maps
Readings: Chapter 3

Unit 12: Soil Erosion
Plants and Ways to Prevent Soil Erosion
Readings: Chapter 15

Unit 13: Uses for Soil
Site Evaluation
Readings: None

Final Exam

Evaluation of Student Learning

Students will be evaluated based on the following point system.

Midterm Exam	100 points
Final Exam	100 points
Weekly Lab Reports	280 points
Weekly Quizzes	<u>220 points</u>
Total Points	700 points

Mercer's Grading System:

A	93 – 100
A-	90 – 92
B+	87 – 89
B	83 – 86
B-	80 – 82
C+	77 – 79
C	70 – 76
D	60 – 69
F	0 – 59

Explanation of Point System:

Exams - Exams will be based on both lecture and laboratory material. The midterm exam will be based on the first half of the course. The final exam is based primarily on the second half of the course. The dates of both exams are “TBD”, and the exams will happen in-person on campus.

Weekly Quizzes - Quizzes will be given during lecture time each week and will cover the material from the previous week. Each quiz is worth 20 points and will be given at the beginning of lecture time via BlackBoard. The lowest quiz grade will be dropped at the end of the semester.

Weekly Lab Reports – In-person lab reports are due before you leave lab each week, and are worth 20 points. Remote lab reports are due via BlackBoard and are also worth 20 points. The lowest lab report grade will be dropped at the end of the semester.

Policies:

Make-up Policy: The instructor must be notified within 24 hours of an exam if it is going to be missed for an excused reason. (Excused absences include illness, death, transportation problems etc.) If this is done, the student will be able to make up the exam at the convenience of the instructor as long as proper documentation is provided. Otherwise, no make-up will be offered.

Cell Phone Policy: According to college policy, the ringer on cell phones must be turned off during lab and lecture. In addition, text messaging is not allowed during lab or lecture.

Lab Dress Code: You must wear sturdy shoes to lab. This means no open toe shoes, flip-flops or sandals.

Academic Integrity Statement

“Any student a) who knowingly represents the work of others as his/her own; b) uses or obtains unauthorized assistance in the execution of academic work; or c) gives fraudulent assistance to another student is guilty of cheating. Violators will be penalized in accordance with established policies and procedures.

In this course, you will receive a grade of “0” for the assignment you are working on, and you will be reported to the college’s Academic Integrity Committee”.

Office of Student Services:

Mercer County Community College is in compliance with both the ADA and section 504 of the Rehabilitation Act. If you have, or believe you have, a differing ability that is protected under the law please see Arlene Stinson in LB 216{570-3525 {stinsona@mccc.edu} for information regarding support services.