

Model Decentralized Wastewater Practitioner Curriculum

SOILS 110 Soil Morphology

Suggested Course Materials

Writing Team

David Lindbo, NCSU
Randy Miles, University of Missouri
Del Mokma, Michigan State University
Mark Stolt, University of Rhode Island
Scott Greene, Guilford County Health Dept.

david_indbo@ncsu.edu (Leader)
milesr@missouri.edu
mokma@msu.edu
mstolt@uri.edu
sgreene0@co.guilford.nc.us

February 2005

NDWRCDP Disclaimer

This work was supported by the National Decentralized Water Resources Capacity Development Project (NDWRCDP) with funding provided by the U.S. Environmental Protection Agency through a Cooperative Agreement (EPA No. CR827881-01-0) with Washington University in St. Louis. These materials have not been reviewed by the U.S. Environmental Protection Agency. These materials have been reviewed by representatives of the NDWRCDP. The contents of these materials do not necessarily reflect the views and policies of the NDWRCDP, Washington University, or the U.S. Environmental Protection Agency, nor does the mention of trade names or commercial products constitute their endorsement or recommendation for use.

CIDWT/University Disclaimer

These materials are the collective effort of individuals from academic, regulatory, and private sectors of the onsite/decentralized wastewater industry. These materials have been peer-reviewed and represent the current state of knowledge/science in this field. They were developed through a series of writing and review meetings with the goal of formulating a consensus on the materials presented. These materials do not necessarily reflect the views and policies of North Carolina State University, and/or the Consortium of Institutes for Decentralized Wastewater Treatment (CIDWT). The mention of trade names or commercial products does not constitute an endorsement or recommendation for use from these individuals or entities, nor does it constitute criticism for similar ones not mentioned.

Soils 110

Suggested Course Materials

Table of Contents

Agenda	1
Overview.....	4
Goals	5
Learning Objectives.....	6
Prerequisites.....	7
Evaluation Form	8
Problem Sets.....	9
Additional Materials.....	10

Soils 110

Agenda

	Description	Instructor
Time		
	Day 1	
830-900	Welcome Introduction Course Objectives Schedule Instructors	
900-1015	Homework assignment Generalized theory of soil genesis: Process model a) additions to the soil, b) losses from the soil, c) transfers within the soil, d) transformations within the soil.	
1015-1030	Break	
1030-1200	Generalized theory (continued)	
1200-1245	Lunch	
1245-200	Soil Texture Particle size classification systems Particle size classes and the textural triangle review Soil Structure and Consistence Structure grade, classes and type review Soil forming processes that influence structure Consistence	

200-315 Soil Horizons, Morphology to Identify Them and Interpretations
Master horizons
Subordinate horizons
Transitional horizons
Soil wetness conditions
Restrictive horizons
Parent material and the C horizon

Saprolite and weathered rock

315-330 Break

330-445 Field Practicum No. 1 – Soil Horizons and Soil Color
Soil horizons and color from soil monoliths, cores, and pits
Redoximorphic features
Anaerobic vs. aerobic soil status
Structure

445-500 **Homework Assignment**
Determine soil horizons from description
Evaluate land use potential for select soil series descriptions
Determine what, if any, restriction exist

DAY 2

800-945 Review of Homework Assignment

945-1015 Landscape Position, Topography, and Drainage

1015-1030 **Break**

1030-1200 Field Practicum No. 2 – Texture, Structure, and Consistence
Texture from disturbed samples
Structure examples
Consistence from disturbed samples

1200-1245

Lunch

1245-330

Field Study No. 3 - Soil Morphology and
Landscape Position

Work in small groups to describe soils in pits
Establish the number of horizons to be described
in each pit
Illustrate "official" judging area to remain
undisturbed in each pit

Morphological profile description of soil color,
texture, structure, consistence, horizon, depth,
restrictive layers and landscape position working
next to the "official" judging area in each pit

330-500

Field Study No. 2 - On-Site Wastewater
Suitability

Faculty review of morphological descriptions at
pits
Comparison of auger boring with pit description
Faculty demonstration of soil and site evaluation
for septic systems
Field practice determining site suitability for on-
site systems

Soils 110

Overview

This is a two-day short course that introduces participants to the "language of soils"; that is, the specific terminology used by soil scientists to describe soil profiles, and the landscapes they occur within, in the field. In addition to learning terminology, students will work in small teams and utilize soil monoliths and a field practicum approach to describe soil profiles and landscapes under the guidance of experienced soil scientists. Once this workshop is completed, the students should be able to make accurate descriptions of soil texture, structure, color and consistence on a limited range of local soil types and be prepared to take more advanced soil description workshops.

Soils 110

Goals

1. Participants will master an advanced working knowledge of the “language of soil profile description,” that is the terminology used for accurate field descriptions of soil morphology including color, texture, structure, consistence and horizon identification.
2. Participants will begin learning how to apply their soil morphological description skills to a typical land use question – land suitability for an on-site wastewater treatment system.

Soils 110

Learning Objectives

1. Participants will improve their ability to identify and describe soil morphology in the field and recognize important soil horizons and special features.
2. Participants will be able to use soil morphology to identify aerobic vs. anaerobic status of the soil.

Soils 110

Prerequisites

SOILS 100

Soils 110 Evaluation Form

Soils 110 – Field Description of Soils

Evaluation Form

Name (optional): _____

With a rating scale of 1 (Disagree) to 5 (Agree), please respond to the following questions

Review of printed materials:

	Disagree				Agree
The text completely covers the topic area.	1	2	3	4	5
The visuals completely cover the topic area.	1	2	3	4	5
The discussion notes completely cover the topic area.	1	2	3	4	5

Review of learning objectives:

I gained a better understanding of topographic relationships.	1	2	3	4	5
I gained a better understanding of soil horizons.	1	2	3	4	5
I gained a better understanding of redoximorphic features.	1	2	3	4	5
I gained a better understanding of soil description.	1	2	3	4	5
I gained a better understanding of profile interpretation.	1	2	3	4	5

What specific recommendations would you provide for the text.

What specific recommendations would you provide for the visuals.

What specific recommendations would you provide for the notes.

Please give specific positive comments on the topic/module.

Soils 110

Problem Sets

None

Soils 110

Additional Materials

Munsell Color Books

Augers

Tape Measures

Several texture samples

Structure samples

Consistence samples

County Soil Survey

Soil Monoliths or Cores

Soil Pits