

# Fundamentals of Soil Genesis, Classification, and Morphology

August 21 and August 28, 2013

*Certified Soil Scientist Preparatory Short Course offered by the Soil Science Society of America*

**Primary Instructor:** Dr. Mike Konen  
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**Facilitator:** Dr. Dawn R. Gibas, Licensed and Certified Soil Scientist  
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## Fundamentals of Soil Genesis, Classification, and Morphology Description:

Soils are an integral part of ecological and agricultural systems. Soils occur as a continuum across the landscape and their properties change in a predictable fashion both across the landscape and with depth. An understanding of soil morphology and the spatial distribution of soil properties is critical in the land-use decision making process. This two week course will cover topics such as soil morphology, soil forming factors, soil genesis, soil classification, soil mapping, and soil geomorphology.

This course is taught via distance learning, but the instructor will supplement lecture material with additional readings and practical examples to illustrate the concepts and provide practical examples of how the concepts are used in practice. This course is designed to complement the students existing knowledge of soil science and help the student understand the principles behind the Soil Science Performance Objectives, which define the practice of soil science.

## Class Schedule/Time:

Orientation will be posted by August 19 for viewing on your own and the Soil Chemistry and Mineralogy portion of the course will be Wednesday August 21 and August 28 (two weeks); the course will conclude on Wednesday, August 28, 2013.

Class times will be 7:00 to 9:00 PM Eastern/ 6:00 to 8:00 PM Central/ 5:00 to 7:00 PM Mountain/ 4:00 to 6:00 PM Pacific.

Most class periods will last the full two hours with a 10 minute break halfway through. The software that is used for the course will allow students to enter questions that they would like the instructor to answer. If there is time at the end of the class, the instructor may use that time to answer questions, but all questions will be answered in writing and then posted on the course website.

To achieve the greatest benefit from this course, students will be expected to spend time attending all the classes, reading any needed supplemental materials, and completing the quizzes. The instructors may be contacted at any time via email with questions or comments.

## **Communications Requirements**

The course is delivered live via the web using GoToMeeting software. All sessions are also recorded. *An email address and high-speed internet access are required.* GoToMeeting Systems Requirements:

[http://support.citrixonline.com/GoToMeeting/help\\_files/GTM010003#What](http://support.citrixonline.com/GoToMeeting/help_files/GTM010003#What)

## **Recommended Textbooks** (Optional - to be purchased or obtained by the student)

### **Soil Science Fundamentals Exam – Performance Objectives**

This document can be downloaded for free from the SSSA website:

<https://www.soils.org/files/certifications/fundamentals-exam-objectives.pdf>

### ***The Nature and Properties of Soils*** (Brady and Weil; Pierson/Prentice Hall Publisher)

The current edition is the 14<sup>th</sup> edition, which can be found on Amazon.com for about \$137.00 (new). There are also options to buy used textbooks or rent them from various vendors. You may use earlier editions of this text, but please be aware that some information may not be as up-to-date as the information in the latest edition and instructors may not be able to give you the pages for equivalent information in an earlier text.

### **Other Textbooks** (supplemental materials)

You may choose from these books as needed for supplemental materials.

### **Soil Science Study Guide Book** (\$100.00)

This document may be obtained either in print format or by download from the SSSA website:

[https://portal.sciencesocieties.org/Purchase/ProductDetail.aspx?Product\\_code=190f6ed6-66e3-df11-938b-0013210e308c](https://portal.sciencesocieties.org/Purchase/ProductDetail.aspx?Product_code=190f6ed6-66e3-df11-938b-0013210e308c) Note: This document is slated to be updated and a new version available December 2013.

### **Field Book for Describing and Sampling Soils v 2.0**

Schoeneberger, P.J., Wysocki, D.A., Benham, E.C., and Broderson, W.D. (editors), 2002. NRCS, National Soil Survey Center, Lincoln, NE.

Available free in pdf format from: <http://soils.usda.gov/technical/fieldbook/>

### **Soil Survey Manual**

Soil Survey Division Staff (1993) USDA NRCS Agriculture Handbook no.18

Available free and in doc or pdf format at <http://soils.usda.gov/technical/manual/download.html>

### **Soil Taxonomy (2<sup>nd</sup> edition)**

Soil Survey Staff. 1999. USDA-NRCS, Washington, DC Agriculture Handbook 436

Available free in pdf format from: <http://soils.usda.gov/technical/classification/taxonomy/>

### **Keys to Soil Taxonomy (11<sup>th</sup> edition)**

Soil Survey Staff. 2010. USDA-Natural Resources Conservation Service, Washington, DC.

Available free in pdf format from: [http://soils.usda.gov/technical/classification/tax\\_keys/](http://soils.usda.gov/technical/classification/tax_keys/)

**Note:** Instructor may also add readings as needed.

### **Student Directory Information**

Student name, city/state/country, phone, and email will be included in a listing on the course website and will be available *only* to other Soil Science Fundamentals students and those administering the course. Students can opt out of this listing when registering for the course.

### **Use of Class Materials**

Registrant agrees that the name indicated on the registration form is the sole individual receiving the on-line instruction and the only person completing the on-line quizzes. Individuals found in violation of this policy will be subject to dismissal from this course, revocation of certification, and possible loss of privileges to participate in future offerings from the Soil Science Society of America.

The PowerPoint presentations, class recordings, quizzes, worksheets, and other materials developed specifically for this class are for the educational purposes and use of students registered for this class. Students are not to be copy, forward or share in any way with anyone for any other use without the permission of the Soil Science Society of America.

### **Grading**

A ten question quiz will be offered weekly that covers the materials from the previous week, available for students to take on-line during their own time. Individual performance on weekly quizzes will be provided confidentially to students to give an indication of the mastery of various topics. **No make-up quizzes will be offered.** There will not be a final exam for this course, and grades will not be assigned. Students who complete both quizzes or accumulate at least 14 of the 20 quiz points (70%) can request a certificate of completion for the course. Missed quizzes will count as zero. Certified individuals seeking Continuing Education Units (CEUs) must achieve a passing score (at least 7 of 10) on a quiz to get credit for that particular session.

Quizzes will be posted on the class website by Friday each week and will be due the by the Tuesday following the next class (or 12 days later). ***Access to quizzes will close at 11:59 PM central time; you will need to have completed AND submitted the quiz by that time in order for it to be assigned a score.*** Print out your quizzes before you submit them for your reference and in case a score isn't recorded to be able to show that you took it. Note: The system allows you to take the quizzes multiple times, but only your first score is counted.

*Please make sure that you keep complete the quizzes! See class schedule (below) for availability and due dates of quizzes.*

### **Class Web Site**

Students registered for the course will have access to the class web site where the following will be posted:

- Lecture video recordings; audio with PowerPoint slides.
- PowerPoint slides in pdf format.
- Link to quizzes and answer keys to quizzes.

Access to the class web site will begin August 12 and end one month following the last class period; ending September 28, 2013.

***Class Schedule: Topics, Reading, and Quizzes (subject to modification):***

<b>Week</b>		
Orientation Available on-line by August 19 (access is available anytime)	Introduction to Course and Logistics (This session is not required, but is recommended if you have not taken an on-line course prior to this one.)	No reading required for this class  No quiz
	<b>Soil Genesis, Classification and Morphology</b>	<b>Recommended Readings</b>
August 21	Soil Morphology Soil Forming Factors Soil Genesis	Read Brady and Weil: Chapters 1, 2 Skim Field Book for Describing and Sampling Soils Quiz 1 available August 23
August 28	Soil Classification Soil Mapping Geomorphology	Read Brady and Weil: Chapters 3, 19 Read Soil Survey Manual: Chapters 2, 6 Skim Soil Taxonomy and Keys to Soil Taxonomy Quiz 2 available August 30

**Quiz Due Dates:**

Quiz 1	September 3
Quiz 2	September 10

**Instructor**

**Dr. Mike Konen**

Dr. Konen is currently an associate professor in the Department of Geography at Northern Illinois University and serves as the departments graduate program coordinator. He holds a Ph.D. in Soil Science from Iowa State University, a M.S. in Soil Science from The Ohio State University, and a B.S. in Agronomy from Iowa State University. Dr. Konen is a certified professional soil scientist (SSSA) and a certified professional soil classifier (SSSA & ISCA). He is past chair of the Council of Soil Science Examiners (CSSE) and serves as a director with the DeKalb County Soil and Water Conservation District. Prior to attending graduate school, Dr. Konen worked as a soil scientist for an environmental consulting firm dealing with wetland, water quality, and waste management issues.

Dr. Konen teaches courses in Soil Science, Soils and Land Use Planning, Field Methods, Physical Geography, and Pedology. In 2011 he was honored with the Excellence in Undergraduate Teaching Award by Northern Illinois University. His research program focuses on: human impacts on soils and landscapes; soil carbon sequestration; soil-landscape relationships in glaciated landscapes; glacial and periglacial geomorphology; and post-glacial landscape changes in Midwestern U.S..

## **Facilitator**

### **Dr. Dawn Gibas**

Dr. Dawn Gibas joined the SSSA staff in July 2010 as the Soil Science Program Coordinator. Most recently she was faculty at The Ohio State University in the School of Environment and Natural Resources (SENR) where much of her research was located in Iceland studying successional landscapes, restoration and soil carbon. She still maintains an adjunct faculty position within SENR. Prior to her position at OSU, Dr. Gibas spent the majority of her career in environmental consulting and, for a shorter time, in county government. During her career she has, among other things, owned her own consulting business, managed the MN office of Tetra Tech, and traveled across the U.S. as part of her work. She has a B.S. in soil science from the University of Wisconsin, a M.S. in soil physics and a PhD in Forest Hydrology from the University of Minnesota. Dr. Gibas is both a licensed and certified soil scientist and has worked on issues surrounding the implementation of these programs since the early 1990s; Dr. Gibas has been involved with the Council of Soil Science Examiners since its inception and was the chair for several years. She also held a Governor appointed position as the Soil Science Board Member on the MN Board of Architecture, Engineering, Land Surveying, Landscape Architecture, Geoscience and Interior Design.

Briefly, some of the primary objectives of Dr. Gibas's position with SSSA include overseeing the soil science licensing and certification programs for SSSA (including legislative issues), facilitating continuing education for soil scientists, and to overall help to grow the soil science profession by working with and facilitating communication between the private sector, government and academia.