

**Soil Science 325, Fall 2008**  
**Soil Formation**  
**TR 8:00 - 9:15AM in 357 Soils**

**Brief Description:** Class lectures emphasize soil-forming factors and processes but also consider soil classification, mapping, and geography, land-use applications, and working with soil databases. The field component will involve several trips to Picnic Point and the UW Arboretum and an all-day Saturday trip to Blackhawk Island for examining soils in the field, preparing soil descriptions, and understanding soil landscape relations.

**Pre-requisites:** Introductory soil science or consent of the instructor

**Credits:** 3

**Instructor:** Dr. James (Jim) Bockheim; 435 King Hall; 263-5903; e-mail bockheim@wisc.edu

**Office hours:** [please send email for scheduled appointment]

**Text:** Soil Genesis and Classification, 5th Edition, by S.W. Buol, R.J. Southard, R.C. Graham and P.A. McDaniel. 2003.

**Grading:** The following categories count toward your final grade: 1) unannounced quizzes, 30%; 2) four homework activities, 20%; 3) final exam 20%, and 4) field report and soil data sheet compilation, 30%.

All activities are on the honor system and you are responsible for your own work; however, you may work in groups on the field report.

**Syllabus:**

*Advice: The sub-discipline of Soil Genesis, Morphology, and Classification is one that is very "terminology-rich." To get the most out of the lectures and prepare for unannounced quizzes, you should read the text ahead of class so that the terms introduced as we go along are not totally confusing.*

<b>Lecture</b>	<b>Date</b>	<b>Topic</b>	<b>Click to view/print</b>
1	Sep 2	The concept of soils and how they form (Chapter 1)	
2	Sep 4	Morphology & composition of soils (Chapter 2)	
3	Sep 9	Soil sampling & characterization (Chapter 2)	
4	Sep 11	Soil-forming factors (Chapter 4; Homework 1 due)	Homework Exercise 1; Homework 1 example

5	Sep 16	Soil-forming factors, cont. (Chapter 5; Homework 1 due)	
6	Sep 18	Soil-forming processes (Chapter 3)	
7	Sep 23	Weathering and soil minerals (Chapter 3; Homework 2 due)	Homework Exercise 2
8	Sep 25	Principles of soil classification; U.S. <i>Soil Taxonomy</i> (Chapters 6 & 7)	
9	Sep 30	Modern soil classification systems (Chapters 6 &7)	
10	Oct 2	Gelisols and Aridisols (Chapters 10 & 12)	
11	Oct 7	Spodosols and Andisols (Chapters 9 & 17)	
12	Oct 9	Ultisols and Oxisols (Chapters 16 & 18)	
13	Oct 14	Mollisols and Alfisols (Chapters 8 & 15; Homework 3 due)	Homework Exercise 3
14	Oct 16	Histosols and Hydric soils (Chapter13)	
15	Oct 21	Vertisols, Entisols and Inceptisols (Chapters 11, 14 & 19)	
16	Oct 23	Soil geography	Homework Exercise 4
17	Oct 28	Soil mapping (Chapter 21; Homework 4 due)	
18	Oct 30	Soil information systems (Chapter 23)	
19	Nov 4	Soil interpretations (Chapter	

		22)	
20	Nov 6	Experimental pedology and pedogenic models	
21	Nov 18	Final exam	
Homework should be submitted by 4:00 PM on the defined deadline by e-mail attachment.			

**Additional References:**

Birkeland, P.W. 1999. **Soils and Geomorphology** (3rd edit.). Oxford Univ. Press, NY. 430 pp. [Steenbock Library S592.2 B57]

Duchaufour, Ph. 1998. **Handbook of Pedology: Soils, Vegetation and Environment**. A.A. Balkema. 264 pp. [Geography Library S591 D8413]

Jenny, H. 1979. **The Soil Resource: Origin and Behavior**. Springer-Verlag, NY. 377 pp. [Steen. S592.2 J46]

Schaetzl, R.J. and S. Anderson. 2005. **Soils: Genesis and Geomorphology**. Cambridge Univ. Press

Schoenenberger, P.J., D.A. Wysocki, E.C. Benham, and W.D. Broderson. 1998. **Field Guide for Describing and Sampling Soils**. USDA, NRCS, NSSC, Lincoln, NE  
[\[http://soils.usda.gov/procedures/field\\_bk/main.htm\]](http://soils.usda.gov/procedures/field_bk/main.htm)

Soil Science Society of America. 2001. **Glossary of soil science terms**.  
[\[http://www.soils.org/sssagloss\]](http://www.soils.org/sssagloss)

Soil Survey Division Staff. 1993. **Soil Survey Manual**. U.S. Govt. Print. Office, Washington, D.C. [\[http://soils.usda.gov/technical/manual/\]](http://soils.usda.gov/technical/manual/)

Soil Survey Staff. 2006. **Keys to Soil Taxonomy** (10<sup>th</sup> ed.). USDA, NRCS  
[\[http://soils.usda.gov/technical/classification/tax\\_keys/\]](http://soils.usda.gov/technical/classification/tax_keys/)

Soil Survey Staff. 1999. **Soil Taxonomy: a Basic System of Soil Classification for Making and Interpreting Soil Surveys** (2nd ed.). Agric. Handb. No. 436, USDA Natural Resources Conserv. Serv., U.S. Govt. Print. Office, Washington, D.C.  
[\[http://soils.usda.gov/technical/classification/taxonomy/\]](http://soils.usda.gov/technical/classification/taxonomy/)

Wilding, L.D., N.E. Smeck, and G.F. Hall (eds.). 1983. **Pedogenesis and Soil Taxonomy**. Developments in Soil Science, Vol. 11A-11B. Elsevier, N.Y.

Some Additional Websites:

<http://soils.usda.gov> - USDA Nat'l. Resource Conservation Service

<http://soils.usda.gov/gallery/> - NRSC photo gallery

<http://lawr.ucdavis.edu/classes/ssc100/index.html> - Univ. of California-Davis, introduction to soil science (Prof. Mike Singer)

<http://soils.ag.uidaho.edu/soilorders/> - Univ. of Idaho soil profiles (Prof. Paul McDaniel)

<http://www.fao.org/docrep/W8594E/W8594E00.htm> - World Reference Base for Soil Resources

<http://www.soils.org> - Soil Science Society of America