

**Soils and Land Use**  
**ESP 250**  
**Sample syllabi**

**Instructor:** Dr. Samantha Langley-Turnbaugh, 106A Bailey Hall, Phone: 780-5361;  
 email: langley@usm.maine.edu

**Text:** Brady, N.C. and R.R. Weil. 2002. The Nature and Properties of Soils, 13th edition.

**Course goals:**

- (1) gain an awareness of soils as important components of natural human environments
- (2) collect field and lab data, and formulate appropriate land uses based on soil properties
- (3) research information on the factors that control the formation and distribution of soils and their physical, chemical and biological properties, and synthesize this information to make recommendations about soil management

This basic soils course is also designed as a preparation for further studies in subsurface contaminant remediation.

**Lecture Schedule** (subject to change)

| <u>Date</u> | <u>Topic</u> | <u>Readings</u>                                       | <u>HW</u>                   | <u>SOW</u> |                |
|-------------|--------------|---|-----------------------------|------------|----------------|
| Sept        | 7            | Intro to soils, soil morphology                       | Ch. 1                       |            | Berkshire fsl  |
|             | 12           | Soil morphology, soil forming factors                 | Ch. 2,4                     |            | Paxton fsl     |
|             | 14           | Pedogenic processes, weathering processes             | Ch. 2,4                     |            |                |
|             | 19           | Soil classification, mapping, interpretations         | Ch. 3                       | MP         | Windsor ls     |
|             |              |   | *Intro to Soil Surveys      |            |                |
|             | 21           | Soil classification, mapping, interpretations         | Ch. 3                       | #1         |                |
|             | 26           | Soil information systems                              | Ch. 19                      |            | Chesuncook     |
|             | 28           | Catch up/Review                                       |                             |            |                |
| Oct         | 3            | <b>EXAM 1</b>   |                             |            |                |
|             | 5            | Soil colloids and ion exchange                        | Ch. 8                       |            |                |
|             | 10           | <b>No Class – Oct break</b>                           | Ch. 8                       | #2         | Limerick-Saco  |
|             | 12           | Soil colloids and ion exchange                        | Ch. 12                      |            |                |
|             | 17           | Soil organic matter                                   | **OM                        |            | Augres ls      |
|             | 19           | Soil organisms and ecology                            | Ch. 11                      |            |                |
|             |              |   | ** BD, Soil Biology Primer  |            |                |
|             | 24           | Catch up/review                                       |                             |            | Hollis fsl     |
| Nov         | 26           | Soil/water relationships; frost heaving, shrink-swell | Ch. 5, 6                    | # 3        |                |
|             |              |   | ** AWC infiltration, crusts |            |                |
|             | 31           | Acidity and alkalinity                                | Ch. 9,10                    |            | Woodbridge fsl |
|             |              | ** pH, salinization                                   |                             |            |                |
| Nov         | 2            | Biogeochemical cycling, plant growth                  | Ch. 13, 14, 15              | # 4        |                |
|             | 7            | <b>No class – SSSA meetings</b>                       |                             |            |                |
|             | 9            | <b>EXAM 2 (thru acidity and alkalinity)</b>           | Ch. 16                      |            | Hermon vssl    |

|     |    |   |                                    |                         |
|-----|----|---|------------------------------------|-------------------------|
|     | 14 | Nutrient management, food supply,<br>alternative ag | ** pesticides                      |                         |
|     | 16 | Film on alternative agriculture                     |                                    | Soil map due Buxton sil |
|     | 21 | Land degradation and soil erosion                   | ** erosion, deposition, compaction |                         |
|     | 23 | <b>No Class – Thanksgiving break</b>                | Ch. 17                             |                         |
|     | 28 | Clean Soil Act/Biosolids                            |                                    | Elmwood fsl             |
|     | 30 | Waste disposal and water quality                    |                                    |                         |
| Dec | 5  | Wetland/Hydric soils                                |                                    | Scantic sil             |
|     | 7  | Soils and chemical pollution                        | Ch. 18                             |                         |
|     | 12 | Review  |                                    | Suffield sil            |
|     | 14 | Review  |                                    | Land use plan due       |
|     | 21 | <b>FINAL EXAM 10:45-12:45</b>                       |                                    |                         |

\* [ftp://ftp-fc.sc.egov.usda.gov/NSSC/Educational\\_Resources/surdown.pdf](ftp://ftp-fc.sc.egov.usda.gov/NSSC/Educational_Resources/surdown.pdf)

\*\* read soil quality information sheets at USDA NRCS website

### Lab Schedule (subject to change)

| <u>Date</u> | <u>Activity</u>  |
|-------------|--|
| Sept 12     | Elements of soil profile descriptions, agricultural soils (field lab)            |
| 19          | Hardwood and Hydric Soils (field lab)  |
| 26          | Topography and drainage (field lab)  |
| Oct 3       | Topography and drainage (field lab)  |
| 10          | <b>No lab – Oct Break</b>  |
| 17          | Individual soil pit description and sample collection*                           |
| 24          | Organic matter determination   |
| 31          | Soil testing and pH  |
| Nov 7       | <b>No Lab</b> – Independently complete soil survey lab, and work on map projects |
| 14          | Water holding capacity and soil-water balance                                    |
| 21          | Garden soil analysis   |
| 28          | Bulk density, particle density and porosity                                      |
| Dec. 5      | Particle-size analysis   |
| 12          | Heavy metal analyses   |
|             | <b>Synthesis report on soil analyses due by Dec. 16.</b>                         |

\*All further soil analyses will be performed on samples the students have collected. Samples must be collected, weighed (wet weight) dried, weighed (dry weight), ground and ready for analyses by October 24.

