**Applied Soil Ecology and Conservation**
**Course ENV*K244, Course Number 31462**
**Meeting Day and Time: Tuesday and Thursday 1:00 – 2:15 pm, Room B210**
**Course Instructor: Meredith Metcalf (Office: Room C202)**
**Email: meredithmetcalf@yahoo.com or mmetcalf@trcc.commnet.edu**
**Office Hours: Tuesday and Thursday 11:00 am – 12:00 pm or by appointment**

## Required Text:

Brady, Nyle C. and Weil, Ray R. (2010) Elements of the Nature and Properties of Soil, Third Edition. Prentice Hall; Upper Saddle River, New Jersey.

Most of the background information for this course you can get from the **required** textbook above. In addition, there will also be discussion threads based on supplementary articles that I provide and we will continually refer to Web sites

## Course Description:

The **objective** of this course is to give you a fundamental knowledge of soil science. If you are a student interested in agricultural, forest, rangeland, wetland, or constructed ecosystems, a basic understanding of soils is essential for you. The soil provides an ideal system in which to observe practical applications for basic principles of biology, chemistry, and physics. In turn, these principles can be used to minimize the degradation of soil as one of fundamental resources of our natural environment.

## Learning Objectives:

Most important goals of this course are to be able to:

- Know the basic terms and concepts used for the description, study, and management of soils
- Understand the physical, chemical and biological properties of soil and how these properties influence soil functions
- Understand soil functions, relationship with soil properties and classification, and the relationship to land use and management for production of foods, fiber and fuels and also for environmental services and recreation
- Appreciate the role of soils and soil management as critical components of environmental systems and improving environmental quality.

# Tentative Schedule

| Week/Date | Topics | Quiz/Exam | Reading Required | What's Due? |
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| **Week 1**<br>**August 26th, 31st, and September 2nd** | Introductions<br>1) Soils Around Us – Understanding how soils are crucial to life on Earth, making soil profiles<br>2) Formation of Soils from Parent Materials, identifying parent material and important minerals | | Chapters 1 and 2 | **Sept. 2nd –**<br>**Soil Profile**<br>**Study Questions**<br>**Chapter 1 - 3, 7, 8, and 10**<br>**Chapter 2 - 3, 5, 9** |
| **Week 2**<br>**September 7th and 9th** | 3) Soil Classification and Soil Taxonomy<br>Determine local soils | | Chapters 3 | **Sept. 9th –**<br>**Rock and Mineral Identification Sheets**<br>**Study Questions**<br>**Chapter 3 – 3, 5, 7, 11, 13** |
| **Week 3**<br>**September 14th and 16th** | 4) Soil Architecture and Physical Properties of Soils<br>Determine soil color, texture, minerals, moisture content, etc. | | Chapter 4 | **Sept. 16th –**<br>**Study Questions**<br>**Chapter 4 – 2, 5, 7, 9, 10** |
| **Week 4**<br>**September 21st and 23rd** | 5) Soil Water: Characteristics and Behavior – understanding how water relates to soil and how water moves through the soil. | | Chapter 5 | **Sept. 23rd –**<br>**Study Questions**<br>**Chapter 5 – 6 - 10** |
| **Week 5**<br>**September 28th and 30th** | 6) Soil and Hydrologic Cycle – Understanding the Global Hydrologic Cycle and how it relates to percolation and groundwater and septic systems | **Quiz 1** | Chapter 6 | **Sept. 30th –**<br>**Study Questions**<br>**Chapter 6 – 2, 9, 10, 13, 14** |
| **Week 6**<br>**October 5th and 7th** | 7) Soil Aeration and Temperature<br>Begin Library Research for Group Presentations | | Chapter 7 | **Oct. 7th –**<br>**Study Questions**<br>**Chapter 7 – 1, 4, 5, 7, 10** |
| **Week 7**<br>**October 12th and 14th** | 8) The Colloidal Fraction: Seat of Soil Chemical and Physical Activity | | Chapter 8 | **Oct. 14th –**<br>**Study Questions**<br>**Chapter 8 – 1, 2, 6, 10, 11** |
| **Week 8**<br>**October 19th and 21st** | 9) Soil Acidity, Alkalinity, Aridity, and Salinity<br>Determine for local soils | | Chapter 9 | **Oct. 21st –**<br>**Study Questions**<br>**Chapter 9 – 3, 4, 5, 6, 13** |
| **Week 9**<br>**October 26th and 28th** | 10) Organisms and Ecology of the Soil | | Chapter 10 | **Oct. 28th –**<br>**Study Questions**<br>**Chapter 10 – 2, 4, 5, 7, 9** |
| **Week 10**<br>**November 2nd and 4th** | 11) Soil Organic Matter<br>Factors that influence organic matter<br>How organic matter relates to the carbon cycle | **Quiz 2** | Chapter 11 | **Nov. 4th –**<br>**Study Questions**<br>**Chapter 11 – 2, 3, 7, 9** |
| **Week 11**<br>**November 9th**<br>**November 11th – NO CLASS** | 12) Nutrient Cycles and Soil Fertility<br>Measure nitrogen, sulfur, phosphorus, potassium, magnesium, and calcium of local soils and understand what the concentrations mean. | | Chapter 12 | **Nov. 9th –**<br>**Study Questions**<br>**Chapter 12 – 1, 2, 5, 6, 12** |

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| **Week 12**<br>**November 16th and 18th** | 13) Practical Nutrient Management<br>Library Research for Group Presentation | | Chapter 13 | **Nov. 18th – Study Questions Chapter 13 – 1, 2, 4, 7, 12** |
| **Week 13**<br>**November 23rd and 25th** | 14) Soil Erosion and Control | | Chapter 14 | **Nov. 25th – Study Questions Chapter 14 – 4, 6. 7, 9** |
| **Week 14**<br>**November 30th and December 2nd** | 15) Soils and Chemical Pollution | **Quiz 3** | Chapter 15 | **Dec. 2nd – Study Questions Chapter 15 – 1, 2, 4, 5, 10** |
| **Week 15**<br>**December 7th and 9th** | Start Group Presentations: Hand in Presentations<br>Final: Chapter material – probable cumulative, possibly questions on topics discussed in class, and videos | Presentations | | |
| **Week 16**<br>**December 14th and 16th** | | Final Exam | | |

**Grading**

***30% Quizzes (each quiz is worth 10% of your final grade)*** – Quizzes will be given ***APPROXIMATELY*** on the dates specified above. The exact date and content of each quiz will be stated in class the week prior to the scheduled quiz. **There will be no make-up of quizzes without prior approval.**

***20% Final Exam*** – A **cumulative** final exam will be given at the end of the semester. Date and time to be announced.

***15% Assignments*** – Each student is required to answer the study questions (from the end of the chapter) specified on the above tentative schedule each week. All assignments are due on the dates specified; however, any changes in due dates will be stated in class.

***20% Presentation*** – Library research work and group presentations are mandatory for a passing grade. Groups of 3 to 5 students will be required to present a power point presentation at the end of the semester. All students are expected to be in class to give their group presentation AND see presentations of fellow classmates. Presentations will be discussed within the first weeks of the course such that students are able to adequately research and investigate the topic they have chosen and present the project to the class in a timely manner.

***15% Attendance and Participation*** – Regular attendance and class participation is expected of each student.

Grade Scale: There will be no grading on the normal distribution curve.

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| A | 100.00 – 93.50 |
| A- | 93.49 – 90.00 |
| B+ | 89.99 – 87.50 |
| B | 87.49 – 84.50 |
| B- | 84.49 – 79.50 |
| C+ | 79.49 – 77.50 |
| C | 77.49 – 73.50 |
| C- | 72.49 – 69.50 |
| D+ | 69.49 – 63.50 |
| D | 63.49 – 59.50 |
| F | 59.49 – 00.00 |

*Extra Credit May Be Offered*: The number of extra credit points is at the instructor's discretion and what the student will do to obtain the extra credit must also be discussed in advance. Example of extra credit may be the student conducting a class discussion on a current environmental issue observed in the news.

**Course Policies**

*Field Work:* Some field work is required – Dates are to be determined. Mandatory field trips will count as an essay grade.

*Electronic Devices (cell phones, MP3 players, etc.)*: These devices must be turned off when entering the room to maintain a respectful class atmosphere. You will be asked to leave if you disregard this requirement.

*Late/Missed Work:* All assignments are due on the date specified in class. After this time the assignment will not be accepted and the student will receive a zero.

*Add/Drop*: The last day to add/drop and obtain partial tuition refund for this course is September 8th, 2010.

*Withdrawal*: The last day to withdrawal from this course is December 9th, 2010.

*Incomplete*: An incomplete must be finished within 60 days of the last day of the Fall 2010 Semester.

*Academic Conduct*: It is expected that each student will turn in only his or her own work. Violations of the Student Code are taken seriously. This includes copying or sharing answering on tests or individual assignments, plagiarism, or having someone other than yourself do your work. Depending on the act, a student could receive an F grade on the test/assignment, an F grade for the course, or could be suspended or expelled.

For Your Knowledge, cheating and plagiarism are defined below:

> Cheating is defined as the giving of assistance to another or the receiving of assistance from another person, another examination

paper, other written material, or any source not explicitly permitted by the instructor, is cheating. Thus, you may not look at another's paper or answers; you may not show your paper or answers to another or leave your paper or answers around for others to look at; and, you may not verbally read or reveal your answers to another. It is also cheating to have access, without the instructor's approval, to examination, quiz, or test questions prior to the administration of the examination, quiz, or test.

Plagiarism is the submission or presentation of ideas or work in any form that are not one's own without appropriate acknowledgement of the source(s). Even with the acknowledgement, close paraphrasing can constitute plagiarism. You may quote the work of others if properly referenced.

*Special Needs:* Please inform me as soon as possible if you require any accommodations in addition to those provided here.