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# Soils: NRM 5327

Sul Ross State University  
Fall 2023



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## INSTRUCTOR

Dr. Rob Kinucan  
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## COURSE MEETING TIMES

This is an asynchronous course with no formal meeting times. You should plan on spending at least 2 hours per credit hour per week on the class so that you can learn the material and successfully complete the class.

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## COMMUNICATION EXPECTATIONS and OFFICE HOURS

Please use the **Virtual Office Discussion Forum** for issues related to the Online Soils Blackboard (Bb) course, its contents or activities. Because we subscribe to this forum, an email will be sent to me. I will respond within 24 hours during the work week and am available Monday through Friday 8–5. If you reach out during the weekend, I will respond as soon as possible, but please expect a delayed response. My virtual office hours are Tuesday at 10:00 and Wednesday at 2:00 p.m. I am also available by appointment.

Please use the **Blackboard Help Desk** for issues related to technical problems with Blackboard.

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## TEXTBOOK

Required: **The Nature and Properties of Soils, 13th Edition** by Nyle C. Brady and Ray R. Weil. Other versions will also work (e.g., 14<sup>th</sup> and 15<sup>th</sup> editions), but the 13<sup>th</sup> has timely information, and the used copies available from numerous sources are inexpensive. If preferred, you may be able to rent one of the versions through vendors such as RedShelf and VitalSource.

Other Required Readings: “Horton Hears a Who” by Dr. Suess, available through many libraries or purchased as a used copy.

National Geographic September 2008 issue: Where Food Begins. Available through a National Geographic digital subscription for \$12.00 for one year.

<http://www.nationalgeographic.com/digitalaccess/>

This volume is also available on reserve in the library, and I have made PDF copies accessible in Blackboard. It is also likely available at your local library.

Further recommended reading: If you are interested in learning more about soil, these references are great for gaining more in-depth knowledge:

- Dirt: The Erosion of Civilizations, David R. Montgomery (available as an eBook from the SR library).
- The Soil Will Save Us, Kristin Ohlson (available through interlibrary loan).
- Building Soil: A Down to Earth Approach, Elizabeth Murphy (available through interlibrary loan).

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## COURSE DESCRIPTION

Welcome to Soils! My name is Dr. Rob Kinucan and I'll be working with you this semester to help you gain an appreciation for the soil. I am really interested in plants and animals, and how they interact with each other – their ecology. So, what's the big deal about soil? It's the foundation for all of earth's terrestrial ecosystems and is critical to all plant and animal populations. At first glance the soil is just there, we walk on it and we take it for granted. People call it dirt, and soil scientists find this a derogatory term and react accordingly. Since the dawn of agriculture and human settlement there has been a history of abuse and misunderstanding of how the soil functions and what it takes to keep it healthy and productive. Soils are the foundation of all plant and animal communities. The loss of productive soil has contributed to the collapse of a number of societies and cultures. Understanding the soil is fundamental to all fields of natural resource management, conservation, and agriculture. A basic knowledge of soils is also very helpful in the disciplines of agricultural business and real estate because often these enterprises are based on the value and productivity of soil resources. By the end of the course, I hope you have gained an understanding of the importance and complexity of soil, the ability to measure and record characteristics of the soil, and practices that can help benefit and increase soil health.

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## COURSE STUDENT LEARNING OUTCOMES

**Students are expected to develop the following knowledge throughout the course.**

- Be able to state the importance of and explain the complex function of soils in ecosystems.
- Be able to quantify and explain physical and chemical characteristics of soil.
- Be able to integrate the knowledge of soil conservation and health into allied disciplines such as agronomy and range science.

**Students are expected to develop the following general marketable skills throughout the course.**

- Communication: Students will improve communication skills through group discussions,

written reports and journaling.

- Quantitative and empirical skills: Students will develop quantitative skills through calculations of soil physical and chemical characteristics.
- Critical thinking: Students will practice critical thinking in soil challenges, course projects and in the application of knowledge gained in exercises for specific uses for their soil sample.

## **PROGRAM STUDENT LEARNING OUTCOMES**

### **The graduating student will be able to demonstrate that he/she is able to:**

- Be able to apply statistical concepts and procedures to natural resource data.
  - Be able to evaluate literature and references as they apply to the natural resource field.
  - Be able to demonstrate their knowledge of fundamental and advanced concepts of range and wildlife management.
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## **ADA STATEMENT**

Sul Ross State University is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. Students seeking accessibility services must contact Counseling and Accessibility Services, Ferguson Hall, Room 112; Mailing address: P.O. Box C-122, Sul Ross State University, Alpine, Texas; Telephone: 432-837-8203; More resources can be found at: <https://www.sulross.edu/counseling-and-accessibility-services/>

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## **DISTANCE EDUCATION STATEMENT**

Students enrolled in distance education courses have equal access to the university's academic support services, such as library resources, online databases, and instructional technology support. More information about accessing these resources can be found on the Sul Ross Blackboard Institution Page when you log into Blackboard. You can correspond with me using Sul Ross email accounts. Submit online assignments through Blackboard which requires secure login information to verify students' identities and to protect students' information. The procedures for filing a student complaint are included in the student handbook. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website.

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## **ACADEMIC INTEGRITY**

"The University expects all students to engage in all academic pursuits in a manner that is beyond reproach and to maintain complete honesty and integrity in the academic experiences

both in and out of their classroom. The University may initiate disciplinary proceedings against a student accused of any form of academic dishonesty, including but not limited to, cheating on an examination or other academic work, plagiarism, collusion, and the abuse of resource materials.” – SRSU Student Handbook

**Do your own work and use your own words! I am interested in what YOU know and think!**

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## **CLASSROOM ETIQUETTE**

An advantage to taking an online course is a level of anonymity, which gives students the freedom to share opinions without feeling intimidated. Regardless of how bold you may feel, don't forget that a real person is on the receiving end of your emails and postings. Because written language can be misinterpreted, review your message and make sure it conveys precisely what you mean to say before you click 'Send' or 'Submit.' Disruptive or intimidating behavior will not be tolerated. Disruptive behavior is defined as anything that prevents students from learning and/or prevents the professor from teaching. Especially in discussion forums participants must be courteous and respectful. To respectfully disagree without contempt is a life skill that will serve you well in the future. You have the right to disagree with others, but you should do so diplomatically.

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## **ASSIGNMENT SUBMISSION MAKEUP POLICY**

Turn work in on time! If you have a specific circumstance that prevents you from submitting an assignment on time, reach out as soon as possible. If you have a valid reason, you can discuss with me and possibly submit work late, but 10% will be deducted for each day beyond the deadline. No work will be accepted more than one week late.

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## **GRADES and DETERMINING YOUR COURSE GRADE**

The Blackboard Grade Center defaults to Calculate as Running Total. The system does not tabulate final course grades until all assignments are submitted and graded. Rather than emailing me to ask for your grade, you can view your My Grades page and tabulate current totals. If at any point in the semester you want to gauge your progress, an easy way to calculate a projected grade is to divide the number of points you have earned by the total number of points available in the course. This will provide your grade as it stands at a particular moment in the semester (or at least an estimate), and you can then calculate your potential grade by projecting possible grades for the remaining assignments. Additionally, you will find it helpful to visit the My Grades page to receive feedback from the instructor via comments and assignment grade points. This information will ultimately help you evaluate your current grade and predict future outcomes.

Grade assignment: <60 = F; 60-69 = D; 70-79 = C; 80-89 = B; 90-100 = A

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## **ASSIGNMENTS, DISCUSSION, LAB EXERCISES**

Each Course Unit will have an assignment and discussion. Please make sure you complete these for each course unit and submit them on time. I have grouped units over several week periods and the due dates are noted in Grade Center as well as Calendar. All units are open at the start of the semester, and you have the ability to complete assignments earlier than the due date. At a minimum I encourage you to keep up with the due dates, and if possible, work ahead. All assignments will be accessible at the start of class.

Notes and Readings Activities and Discussion: 100 points  
(These are discussions related to readings and course notes.)

At Home Laboratory Exercises: 100 points  
(These are hands-on exercises documented through your My Soil Field Journal that will help you describe a specific soil and will help tie into your final project. The journal must be completed by November 19 to give you time to complete the Final Project Poster.)

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## **PROJECT**

You will have a project to characterize a soil during the semester. You must have access to a location where you can excavate a soil pit that is roughly two feet deep and 1 foot in diameter. You will need to keep the hole open during the semester, covering with a board to prevent animals from falling into the hole.

Semester-long soil characterization and process project: 100 points  
(This will be a 4'x4' poster – submitted as a PDF, not printed – about a local soil that you select. The final poster must be submitted no later than December 5.)

## SCHEDULE

<b>Fall 2023 August 28-December 11</b>	<b>Content Plan</b>
<p><b>Weeks 1 and 2 (Begins on Monday, August 28)</b></p> <p>Student introductions</p> <p>Course Unit: Introduction to Soil</p>	<p><b>Introduce Yourself (discussion board)</b></p> <p><b>Introduction to Soil</b></p> <p>The five major functions of soil; Basic building blocks of soil, Introduction to soil plant nutrients</p> <p><b>Notes</b></p> <p>Soil Basics</p> <p><b>Reading Assignments</b></p> <p>Chapter 1 in your text, Horton Hears a Who, National Geographic Articles</p> <p><b>Viewing Assignment</b></p> <p>Dirt: The Movie <b>Discussion Board</b></p> <p>Current Attitude toward Soil, The Importance of Soil, Is it a Rock or a Ped?</p> <p><b>Semester project</b></p> <p>Review the Semester Project Assignment and begin thinking about where you would like to establish yoursite – step 1</p>
<p><b>Weeks 3, 4 and 5 (Begins on Monday, September 11)</b></p> <p>Course Units: Soil Formation, Soil Taxonomy, and Soil Physical Properties</p>	<p><b>Soil Formation; Soil Taxonomy; Soil Physical Properties</b></p> <ul style="list-style-type: none"><li>• Selection of Field Site and Excavation of Soil Pit</li><li>• Five Factors of soil formation; Four Basic Processes of Soil Formation</li><li>• Introduction to Soil Taxonomy; Web Soil Survey; Official Series Description</li><li>• Soil Color; Texture; Structure; Rock Fragments; Density and Porosity</li></ul> <p><b>Notes</b></p> <p>Soil Formation, Soil Weathering, Soil Taxonomy, Soil Physical Properties</p> <p><b>Reading Assignment</b></p> <p>Chapter 2, 3, 4, and 19 in your text</p> <p><b>Discussion Board</b></p> <p>Soil Forming Factors, Soil Horizon Development and Weathering, Epipedon and Diagnostic Horizons, Identifying Ped Shape, and Bulk Density</p> <p><b>Semester Project</b></p> <p>Select your field site and begin working on steps 2-4</p>



<p><b>Weeks 6, 7 and 8 (Begins on Monday, October 2)</b></p> <p>Course Units: Soil Water, Soil Air and Temperature, and Soil Biology</p>	<p><b>Soil Water; Soil Air and Temperature; Soil Biology</b></p> <ul style="list-style-type: none"> <li>• Basics of Soil water movement and energy; Function of soil in the hydrologic cycle</li> <li>• Soil Air movement and oxygen/carbon dioxide ratios</li> <li>• Thermal properties of soil and seasonal change</li> <li>• Soil organisms: diversity, species, and soil health</li> </ul> <p><b>Notes</b> Soil Water, Soil Air and Temperature, Soil Biology</p> <p><b>Reading Assignment</b> Chapter 5, 6, 7, and 11 in your text</p> <p><b>Discussion Board</b> Soil water, Irrigated Agriculture: the cantaloupe problem, Canary in the coal, Human use of soil temperature, Soil biology primer, and Soil biology observations</p> <p><b>Semester Project</b> Continue working on your Semester Project with steps 5-6</p>
<p><b>Weeks 9, 10 and 11 (Begins on Monday, October 23)</b></p> <p>Course Unit: Soil Chemistry</p>	<p><b>Soil Chemistry</b></p> <ul style="list-style-type: none"> <li>• Soil Colloids, Surface Area, and Cation Exchange Capacity</li> <li>• Soil pH: Acidity and Alkalinity</li> <li>• Soil Salinity and Sodicity</li> <li>• Impacts of chemical pollutants on soil</li> </ul> <p><b>Notes</b> Soil colloids, and Chemical properties</p> <p><b>Reading Assignment</b> Chapters 8, 9, 10, and 18 in your text</p> <p><b>Discussion Board</b> Soil colloids, Acid, neutral or basic, Salting the Earth, and Cleaning up an oil spill</p> <p><b>Semester Project</b> Continue working on your Semester Project with step 7</p>
<p><b>Weeks 12 and 13 (Begins on Monday, November 13)</b></p> <p>Course Units: Soil Organic Matter; Plant Nutrients</p>	<p><b>Soil Organic Matter; Soil Nutrients</b></p> <ul style="list-style-type: none"> <li>• Soil Organic Matter</li> <li>• Macro and micronutrient cycles and impacts</li> </ul> <p><b>Notes</b> Soil organic matter, Soil stability, Introduction to soil nutrients, and Nutrient cycles and plant response</p> <p><b>Reading Assignment</b> Chapters 12, 13, 14, 15, and 16 in your text</p> <p><b>Discussion Board</b> Soil organic matter, Soil stability test, Plant nutrients, and Nutrient cycles</p> <p><b>Semester Project</b> Continue working on your Semester Project with steps 8 and 9</p>

<p><b>Weeks 14 and 15 (Begins Monday, November 27)</b></p> <p>Course Unit: Soil Conservation</p> <p>Final Project Due Monday, December 11</p>	<p><b>Soil Conservation</b></p> <ul style="list-style-type: none"><li>• Soil Erosion</li><li>• Soil Health and Quality</li></ul> <p><b>Notes</b> Soil conservation and erosion</p> <p><b>Viewing Assignment</b> Treating the farm as an ecosystem</p> <p><b>Reading Assignment</b> Chapters 17 and 20 in your text</p> <p><b>Discussion Board</b> Soil Conservation Action</p> <p><b>Semester Project</b> Continue working on your Semester Project with step 9. Due on Monday, December 11 by Midnight</p>
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