

SOIL 2110: Soils - Fall 2021

MWF 9:00 – 9:50 am



Instructor

Dr. Colby Brungard
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Office-hours

Right after class or by appointment (*I will make significant effort to meet you, but my schedule is usually very full. If you need to meet outside of office hours please schedule appointments by email to ensure that I have adequate time to assist you*)

TA 1

Sundar Sapkota
Skeen N257
ssapkota@nmsu.edu

11 AM-12 PM Monday
or by appointment

TA 2

Seth Burruss
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11 AM - 12PM Monday
or by appointment

Course Overview: SOIL. Who would have thought it so important (and fascinating)?

Soil is a reusable, but not really renewable, natural resource that directly impacts you. Join me this semester in exploring the fascinating world of soil and how it impacts us. I also hope that you will discover that a thorough **understanding** of basic soil science and the **ability to perform common calculations** will be useful for your future study and careers in soil and environmental science, hydrology, climatology, geology, ecology, horticulture, agronomy, and other fields.

Your Instructor

My name is Colby Brungard. One remarkable thing about me is that I never intended to go to college, much less wind up teaching at one! I grew up in a semi-agricultural area of northern Colorado (near the towns of Boulder and Lyons) on the edge of a mesa. I spent a lot of time exploring this area on foot and in a 4x4 and wound up with deep seated questions about why mountains, valley, mesas, and rivers existed where they did (in retrospect I was probably an odd kid!). I did well in geology, PE, and welding class, but I barely graduated high school. After high school I spent two years in the Philippines as a missionary for the Church of Jesus Christ of Latter-day saints. This experience only increased my wonder of the natural world (volcanoes, oceans, islands, and dense tropical forests are really amazing), but it also developed my desire to help other people improve their lives. After I got back from the Philippines I didn't really have any specific plans for my future so I bounced around several universities until I stumbled across a course in physical geography at Utah State University that started to answer some of my questions about how landscapes develop. After getting married and completing a summer internship with the Bureau of Land Management I found myself in a soils class which I thought was absolutely fascinating. The professor teaching the course eventually gave me a job in her lab, and then offered me a chance to pursue two graduate degrees. My schooling took a long time and it was difficult at times. I once totally bombed a biogeochemistry class that was team taught by two professors. The grade in the class depended on a 1-hour oral exam that consisted of answering a randomly chosen question in front of both professors. I didn't do so great, (actually I did terribly). However, I eventually graduated and got my current position at NMSU. I have now studied soils for 14 years and have taught it for 5 years. My specific field of interest is soil survey and exploring the soils that exist across the continent. My research generally focuses on spatial predictive strategies for using big data and machine learning to predict soil classes and properties across large areas (like the continental USA) and then using this information to support land use and management decisions, but I also use UAV's, spectrometry, and geophysical instrumentation at times. I recruited a previous soil 2110 student to develop a cell-phone based method to measure bulk density that was published.

For hobbies I like fly-fishing. At least I liked it until I moved to southern NM where there isn't any water! I now spend most of my free time remodeling our house and spending time with my wife and 5 kids. I would really like to get back into exploring, especially in the Gila Wilderness.

Enough about me.

I intend to have a lot of fun teaching this course! And I'm going to make sure you enjoy it as well! Help me by contacting me early and often—like today! What better time to get acquainted?

Our Itinerary (AKA Course Objectives)

I've designed this class in a way I think you will like. We'll be reading about soil formation, soil physical and chemical properties, soil water and temperature, soils and climate change, soil colloids, acidity/alkalinity, Nitrogen, and other topics. But we will do more than just read. I intend to help you practice what we read about as much as possible. I don't view my role in this class as 'information transfer', instead my role is to help you apply the material. I favor a sports analogy; I am a coach and you are an athlete. Lecture does you little good. Instead, my teaching philosophy is that I teach you skills, let you practice, and guide your skill development.

Because you won't be assessed on how well you can listen to lecture, but instead on how well you understand the material and can do basic calculations, we will be using a 'flipped' classroom. That means that instead of delivering information to you via lecture, I will instead use our class and lab time to guide you through activities and exercises designed to help you master these skills and abilities.

Using a flipped class approach requires you to read from the textbook ***before*** you come to class so that you have the necessary information. Your before-class study will give you the information that we will then build on by using extensive in-class activities. You WILL be called on by name to share your thoughts with other classmates.

Important Note: On-going research projects and professional research meetings will require that I am not on campus for a few days this semester. If I am out of town, I will pre-record our regularly scheduled classes and post these on-line. I will let you know the exact dates that I will be out of town so you can plan for these, but they will tentatively be Sept 21 - 24, Oct 18 - 22, and Nov 8 - 10.

FAQs

How do I get a good grade (i.e., course expectations)?

1. ***Complete Before Class reading:*** A lot of our success in this class depends on you completing the assigned reading ***before*** class. Because life is busy and I know that you (and I) are doing more than just taking this class, I provide material to guide your reading. These before class readings are numbered according to the section of the chapters that I think are most relevant. Readings are due before class and are submitted via canvas. Please be aware that because of technical issues, ***fill-in-the blank*** questions will be taken directly from the text book and that the answers to these questions require that answers are one (1) word only and that the answers ***exactly*** match the words in the textbook (this means you need to spell the words right to get credit and I won't correct answers for misspelling).
2. ***Participate in lecture:*** Our classes are highly participatory. During every class you will be asked to engage with the material. This means that you will be given a question, work on the question either alone or with other classmates, and then be randomly ***called on by name*** to respond to the question. ***It is completely okay if your answer isn't correct.*** I try to ask questions that help me understand how you are thinking about a topic. During class we will also spend time working through in-class activities which are designed to help you apply the material that you have read about and that we have reviewed in class.
3. ***Complete quizzes:*** A 30-40 question quiz will be given after we complete each textbook chapter. Quizzes will be available on canvas for one week after we finish each chapter from the textbook. Because you have a week for each quiz, no makeup quizzes will be given, but I will drop your lowest quiz score. Quizzes and exams will be T/F, compare/contrast, multiple choice, and calculations. Please note, quizzes cover all material in the chapters, or portions of chapters, that I assign even if we do not discuss the material specifically in class. Therefore, you should read and be familiar with everything that is in the chapter portions that I assign.
4. ***Complete assignments:*** Several calculation-based activities may be assigned throughout the semester. Calculations are very useful (and fun when you understand them). You will also be given a comprehensive take-home assignment at the end of class that will have you apply all of the concepts from class. This assignment will

be assigned during the last week of class (the week between Thanksgiving and the end of class) and I will be available during our regularly scheduled class times to answer questions and help you. This will be due on Monday December 6 by 10 am in lieu of a final exam.

5. Exams – There will be no exams.

6. Graduate students: Graduate students registered for the course will be required to complete additional readings and to submit a short paper on how a specific topic we covered during the semester is relevant to their research.

7. Attendance: Just come to class. Please also bring your textbook and your completed reading outlines to class as you will use them frequently in class.

Do I need the text book?

YES. We will be using Elements of the Nature and Properties of Soils, Brady, N.C. and R.R. Weil (*4th edition*) * Prentice Hall. New and used textbooks are available at the NMSU Bookstore, online, and at reputable bookseller's worldwide. *Should I buy the hard copy or the ebook?* Either version is acceptable. Beyond the cost difference, you may prefer the hard copy vs. the ebook based on how we will use it. You will read from it each week and I ask that you have it available for class. Please purchase/rent the textbook ASAP.

You'll also need a calculator (your cell phone will probably work).

** to be completely honest, you can probably get away with a 3rd edition textbook, but the 4th edition has been highly modified from the 3rd edition so I will not guarantee that quiz questions taken from the 4th edition will match what is in the 3rd edition.*

What about the lab?

The lab (SOIL 252L) is a separate 1 credit course that is only required for certain majors. It's a fun hands-on experience that helps explain many of the lecture concepts, so I encourage you to enroll in it if you have the time and interest. Labs will begin on the first full week of classes (Monday Aug 23 and Wed Aug 25). If you are enrolled in a lab, you only need to attend the session that you are enrolled in.

What if I miss class? I appreciate the effort that you make to attend this highly participatory class, particularly because the course meeting time was not listed correctly. We will record each class, but since these are not traditional 'lectures' but interactive sessions I have some doubt that you can success just by watching them. However, you can earn credit for any quiz or assignment if they are submitted by the due date/time. Please note that late work will *not* be accepted nor will partial credit be given for late work.

COVID clause: If you become ill or need to care for someone who is ill, please let me know as soon as is reasonable. We will work out an arrangement for completing coursework that suits your situation.

COVID Considerations:

If conditions/restrictions develop that restrict face-to-face meetings then we will transition to synchronous online classes via Zoom from inside Canvas. I believe synchronous online course meetings are the best compromise between giving students structure and support while keeping everyone safe. To be clear, I spend very little time lecturing; instead students spend the bulk of class time working with each other. That means you'll have a small group of people who you'll get to know, who will miss you if you're gone, who can help answer any questions you have, who you can help in turn, and with whom you'll be able to build a community. Asynchronous online courses (where students do everything on their own time) are convenient but also require a lot of self-discipline and time management. I hope that synchronous meetings will help students organize their time, succeed in class, and generally feel less alone.

How will I be graded?

You will be graded on the following assignments:

1. Before class reading

2. Chapter quizzes
3. Assignments
4. Comprehensive take home assignment

Grades will be based on the percentage of questions that you get right. For example, if the assignment had 100 questions and you got 80 correct then you would get 80 points for that assignment. At the end of the course, your final grade will be based on the percentage of points you score out of the total possible points. If you feel that graded material has been incorrectly *tallied*, please bring it to my attention immediately.

Syllabus Student Resources & Policy: Please visit <https://provost.nmsu.edu/faculty-and-staff-resources/syllabus/policies.html> for the most up-to-date code of conduct and for information for students with disabilities