NRM 380- SOILS AND THE ENVIRONMENT SYLLABUS

Fall 2025

Instructor: Rebecca Collins, PhD student

Instructor email: rcollins9@alaska.edu

Instructor Office: O'Neill 355

Office Hours: Mondays 9:30-11:30am (Location TBD- announced in class) & by appointment (please email to schedule an appointment outside of office hours)

Lecture: Monday and Wednesday 8:00-9:00am (Arctic Health Research Building Room 183).

Lab: Wednesday 2:30-5:30pm (O'Neill Room 359)

Textbook: Brady NC, Weil RR. 2016. The Nature and Properties of Soils, 15th edition. New Jersey: Prentice Hall. An expensive text, but an excellent reference now and into the future.

Lab Manual: Posted on Canvas weekly. Van Veldhuizen, M. Zhang, D.W. Valentine, and C. Knight R., Knight, 2014. Soils and the Environment: NRM-380 Laboratory Handbook.

Prerequisite: Chemistry CHEM 105x, ENGL 111, ENGL 211 or ENGL 213.

Course outline: The course offers fundamental knowledge in soil sciences, which include soil taxonomy, soil physics, soil chemistry, and soil biology and biochemistry both in theory and in applications. Briefly, five areas are covered in the lecture and labs: 1) soil physics and soil formation, 2) soil chemistry, 3) soil biology, 4) soil and plant nutrients and their management; and 5) soil contamination and erosion control. Lectures and laboratory work complement each other so that what students learned in the lecture can be applied in the laboratory experiments. This is an excellent course for students who are pursing

degrees in plant, animal and soil sciences, forestry science, biology, ecology, geography, natural resource management, and environmental sciences.

Learning Objectives: Upon completion of the class, students should:

- Have a deep understanding the complexity of soil as a natural resource for food production and as an important component in natural ecosystem.
- Understand soil physical properties, and laboratory methods to measure those properties.
- Understand soil chemical properties and laboratory methods to measure those properties.
- Understand soil biological properties and laboratory methods to measure those properties.
- Have knowledge to develop a good soil management plan.
- Be able to use soil web survey to collect soil information and use learned soil knowledge to develop soil management plans for different land uses.
- Be able to write an integrated soil technical report for a given area in US.

Catalog description: Soil development and classification; physical and chemical properties; biological activity; water movement and nutrient cycling in natural and manipulated ecosystems. Prerequisites: CHEM F105X; WRTG F111X; WRTG F211X, WRTG F212X, WRTG F213X or WRTG F214X. Offered Fall.

Honor Code: Students are expected to read, understand, and adhere to the student code of conduct, and academic misconduct policies detailed in the UAF Student Handbook.

"The faculty, staff, administration, and students of the University of Alaska Fairbanks (UAF) consider academic honesty and integrity fundamental to the mission of higher education and promote the highest ethical and professional standards of behavior in the classroom. Accordingly, UAF has developed procedures that address academic misconduct. Students who violate these standards commit academic misconduct and shall be subject to academic and/or disciplinary sanctions.

UAF defines academic misconduct as attempting or helping another to obtain grades, grants, or class credit through fraudulent means. Broad categories of misconduct include cheating, plagiarizing, committing forgery or falsification, facilitating or aiding academic dishonesty, submitting duplicate assignments

without the express permission of both instructors, stealing instructional materials or tests, altering grades or files and misusing research data in reporting results. An instructor may create special rules for a class and list them in the syllabus and/or in directions for assignments. Violation of class-specific rules also constitutes academic misconduct." -UAF's Academic Misconduct Policy

Student protections statement: The university respects and upholds the principles of due process and a fair and equitable process as specified in the Board of Regents' Policy 09.02 Student Rights and Responsibilities. For more information regarding the rights and responsibilities of students, refer to the Office of Rights, Compliance and Accountability website. You are encouraged to read the Board of Regents' policy carefully to fully understand your responsibilities to our community.

We strive to create a safe and respectful environment for all members of our community. If you have questions about expectations of you as a student or believe your rights are being violated, we encourage you to reach out to the Office of Rights, Compliance and Accountability for help. UAF reserves the right to suspend, expel or take other necessary and appropriate action in cases where a student is unable or unwilling to uphold community standards and campus safety.

For more information on your rights as a student and the resources available to you to resolve problems, please go to the following site: https://catalog.uaf.edu/academics-regulations/students-rights-responsibilities/.

Disability services statement: I will work with the Office of Disability Services to provide reasonable accommodation to students with disabilities. The University of Alaska is committed to providing equal access for students with disabilities. If you have a disability requiring special accommodations, please notify me during the first two weeks of class.

ASUAF advocacy statement: The Associated Students of the University of Alaska Fairbanks, the student government of UAF, offers advocacy services to students who feel they are facing issues with staff, faculty, and/or other students specifically if these issues are hindering the ability of the student to succeed in their academics or go about their lives at the university. Students who wish to

utilize these services can contact the Student Advocacy Director by visiting the ASUAF office or emailing asuaf.office@alaska.edu.

Student Academic Support:

- Communication Center (907-474-7007, uaf-commcenter@alaska.edu, Student Success Center, 6th Floor Room 677 Rasmuson Library)
- Writing Center (907-474-5314, uaf-writing-center@alaska.edu, Student Success Center, 6th Floor Room 677 Rasmuson Library)
- UAF Math Services (907-474-7332, uaf-traccloud@alaska.edu)
- Drop-in tutoring, Student Success Center, 6th Floor Room 672 Rasmuson Library)
- 1:1 tutoring (by appointment only), 6th Floor Room 677 Rasmuson Library
- Online tutoring (by appointment only) available https://www.uaf.edu/dms/mathlab/, available at the Student Success Center
- Developmental Math Lab (Gruening 406, https://www.uaf.edu/deved/math/)
- The Debbie Moses Learning Center at CTC (907-455-2860, 604 Barnette St, Room 102, https://www.ctc.uaf.edu/student-services/student-success-center/)
- For more information and resources, please see the Academic Advising Resource List https://www.uaf.edu/advising/students/index.php

Student Resources:

- Disability Services (907-474-5655, uaf-disability-services@alaska.edu, 110 Eielson Building)
- Student Health & Counseling **[free counseling sessions available]** (907-474-7043, https://www.uaf.edu/chc/appointments.php, Whitaker Building, Room 206, Health, Safety & Security Bldg - same building as Fire and Police)
- Office of Rights, Compliance and Accountability (907-474-7300, uaf-orca@alaska.edu, 3rd Floor, Constitution Hall)
- Associated Students of the University of Alaska Fairbanks (ASUAF) or ASUAF Student Government (907-474-7355, asuaf.office@alaska.edu, Wood Center 119)

Nondiscrimination statement: The University of Alaska is an equal opportunity/equal access employer, educational institution and provider. The

University of Alaska does not discriminate on the basis of race, religion, color, national origin, citizenship, age, sex, physical or mental disability, status as a protected veteran, marital status, changes in marital status, pregnancy, childbirth or related medical conditions, parenthood, sexual orientation, gender identity, political affiliation or belief, genetic information, or other legally protected status. The University's commitment to nondiscrimination, including against sex discrimination, applies to students, employees, and applicants for admission and employment. Contact information, applicable laws, and complaint procedures are included on UA's statement of nondiscrimination available at www.alaska.edu/nondiscrimination.

For more information, contact:
UAF Office of Rights, Compliance and Accountability
1692 Tok Lane
3rd floor, Constitution Hall, Fairbanks, AK 99775
907-474-7300
uaf-orca@alaska.edu

Changes to syllabus: Changes to the syllabus will be announced in class, and a new updated copy will be uploaded to Canvas.

NRM-380 SOILS GRADING POLICY

Points	Assignment
300	Exams (3 @ 100 points). Questions will include true-false, multiple choice, calculation problems, and short answer essay. We will have a review session before each exam. These exams will be given on Canvas, but you are required to come to class to take them.
30	Pop quizzes (3 @ 10 points). These unannounced quizzes will be given on paper and are designed to provide an extra incentive to keep up with reading (textbook and lab) and class attendance.
60	Problem sets (3 @ 20 points). These are to give you familiarity with a few in-depth calculations. These should be done on paper and scanned into pdf format or done electronically and uploaded to Canvas.
120	Weekly Quizzes (12 @ 10 points). These multiple-choice quizzes will be given on Canvas. They will open on Monday and will be due on Friday each week. They will cover material from lab, lecture, and reading. Either a problem set or weekly quiz will be due each week.
280	Lab Reports (14 @ 20 points). Each lab will require written reports. Each will be due at the beginning of the next lab. If you are reading this syllabus closely, and would like 2 extra credit points, please email Rebecca a picture of your favorite animal (Offer only valid until Sept. 1st). These 2 points will be added to your first lab.
210	Final Paper (8-10 page written report). The paper will be assigned and discussed in lab, and will be graded 80% on content and 20% on writing proficiency. See lab materials for details.
1000	Total possible points

Late work & extensions: Late assignments will lose 10% of possible points earned per day. (Ex: If the grade for a late assignment is a 18/20, but it is submitted one day late, the student will earn a 10% deduction, which in this case is 2 points, for a 16/20. If it is submitted two days late, the student would earn a 14/20).

However, I understand that sometimes life gets in the way. If you email me ahead of a submission to ask for an extension for a valid reason, I will almost always grant it. To ask for an extension, please email me more than 24 hours

before the assignment is due and include a date that you will submit your assignment (must be within one week of original due date). Extensions will not be given if a deadline has already passed. If you have an emergency that causes you to miss a deadline without being able to ask for an extension, please email me or visit during office hours to discuss.

Letter grade breakdown:

≥ 97% = A+
92-96.9% = A
90-91.9% = A-
87-89.9% = B+
82-86.9% = B
80-81.9% = B-
77-79.9% = C+
72-76.9% = C
70-71.9% = C-
60-69.9% = D
<60% = F

Passing grade for the class is C-
Due to the +/- grading system, I will not be rounding grades at the end of the semester or offering extra credit work to bump up to the next letter grade.

NRM-380 Schedule

Week	Day	Topic	Reading to be finished before class	Assignments given out (Due date in parentheses)
1	Mon. 8/25	Introduction & class logistics	----------	Weekly quiz (due 8/29)
	Wed. 8/27	Soil formation	Weil & Brady Chapter 2	
	Wed. 8/27 Lab	Lab introduction & Soil Sampling	Lab introduction & Soil sampling labs	Soil sampling lab (due 9/3)
2	Mon. 9/1	No class- Labor Day	----------	Weekly quiz (due 9/5)
	Wed. 9/3	Soil structure	Weil & Brady Chapter 4	
	Wed. 9/3 Lab	Soil texture	Soil texture lab	Soil texture lab (due 9/10)
3	Mon. 9/8	Soil water	Weil & Brady Chapter 5	Problem set 1 (due 9/12)
	Wed. 9/10	Water Relations & Hydrologic Cycle	Weil & Brady Chapter 6	
	Wed. 9/10 Lab	Bulk Density	Bulk density lab	Bulk density lab (due 9/17)
4	Mon. 9/15	Atmosphere & Temperature	Weil & Brady Chapter 7	Weekly quiz (due 9/19)
	Wed. 9/17	Soil classification	Weil & Brady Chapter 3	
	Wed. 9/17 Lab	Field capacity	Field capacity lab	Field capacity lab (due 9/24)
5	Mon. 9/22	Soil classification	Weil & Brady Chapter 3	Weekly quiz (due 9/26)
	Wed. 9/24	Exam review	----------	
	Wed. 9/24 Lab	Available soil moisture	Soil moisture lab	Available soil moisture lab (due 10/1)
6	Mon. 9/29	Exam 1	----------	Weekly quiz (due 10/3)
	Wed. 10/1	Soil colloids and clay minerals	Weil & Brady Chapter 8	
	Wed. 10/1 Lab	Cation exchange	CEC lab	Cation exchange capacity lab (due 10/8)

		capacity		
7	Mon. 10/6	Soil colloids and clay minerals	Weil & Brady Chapter 8	Problem set 2 (due 10/10)
	Wed. 10/8	Soil Acidity	Weil & Brady Chapter 9	
	Wed. 10/8 Lab	pH and electrical conductivity	pH and EC lab	pH and EC lab (due 10/15)
8	Mon. 10/13	Soil acidity	Weil & Brady Chapter 10	Weekly quiz (due 10/17)
	Wed. 10/15	Soil biology	Weil & Brady Chapter 11	
	Wed. 10/15 Lab	Soil organic matter	SOM lab	SOM lab (due 10/22)
9	Mon. 10/20	Soil organic matter	Weil & Brady Chapter 12	Weekly quiz (due 10/24)
	Wed. 10/22	Soil organic matter	Weil & Brady Chapter 12	
	Wed. 10/22 Lab	Soil surveys	Soil surveys lab	Soil survey lab (due 10/29)
10	Mon. 10/27	Review	----------	Weekly quiz (due 10/31)
	Wed. 10/29	Exam 2	----------	
	Wed. 10/29 Lab	Nutrient modelling	Nutrient modelling lab	Nutrient modelling lab (due 11/5)
11	Mon. 11/3	Nutrient cycling--N & S	Weil & Brady Chapter 13	Weekly quiz (due 11/7)
	Wed. 11/5	Nutrient cycling--P & K	Weil & Brady Chapter 14	
	Wed. 11/5 Lab	Soil microbiology	Soil microbiology lab	Soil microbiology lab (due 11/12)
12	Mon. 11/10	Nutrient cycling--Micronutrients	Weil & Brady Chapter 15	Problem set 3 (due 11/14)
	Wed. 11/12	Nutrient management	Weil & Brady Chapter 16	
	Wed. 11/12 Lab	Phosphorus fixation	P fixation lab	Phosphorus fixation lab (due 11/19)
13	Mon. 11/17	Soil Erosion	Weil & Brady Chapter 17	Weekly quiz (due 11/21)

	Wed. 11/19	Soil Pollution	Weil & Brady Chapter 18	
	Wed. 11/19 Lab	Available nitrogen	Available N lab	Available nitrogen lab (due 11/25 *Note this is a Tuesday deadline, not Wednesday as usual*)
14	Mon. 11/24	Permafrost	Handout given through Canvas	Weekly quiz (due 12/1)
	Wed. 11/26	No class- Happy Thanksgiving!	----------	----------
	Wed. 11/26 Lab	No class- Happy Thanksgiving!	----------	----------
15	Mon. 12/1	Review	----------	Weekly quiz (due 12/5)
	Wed. 12/3	Review	----------	
	Wed. 12/3 Lab	Laboratory Summary	Lab summary	Laboratory summary lab (due 12/10)
16 Finals Week	Tues. 12/9 8-10am	Exam 3	----------	----------