Soil Ecology – SOCR 441
Spring 2019 – Course Syllabus

Location/Time: Plant Science W212, Tues 2-3pm + Thurs 2-4pm (+ arranged hours)

Instructor: Dr. Steven Fonte
Office: C-105 Plant Sciences;
Email: Steven.Fonte@colostate.edu
Office hours: by appointment

Course Overview:

This course aims to introduce students to basic theory, concepts, and applications of soil ecology. We will focus on understanding the major groups of organisms that inhabit the soil, factors that affect their abundance, and the fundamental ecosystem processes they regulate. The course seeks to provide students with hands-on experience in soil ecological research and techniques for studying different groups of soil organisms. This is capstone course and will emphasize the development of scientific writing and presentation skills, as well as critical evaluation of ecological research.

Course Objectives:

1) Understand the diversity, ecology and functions of the principal groups of soil organisms
2) Examine ecological interactions and implications for key soil processes
3) Learn basic experimental concepts and methods in soil ecological research
4) Critically evaluate scientific literature
5) Gain experience in collecting, analyzing and interpreting experimental data
6) Learn to evaluate and synthesize information for scientific writing

General Expectations:

You are expected to attend class regularly and be prepared to engage in thoughtful and critical discussion of the material.

Everyone is expected to treat one another with courtesy and respect. Recognize that each of us brings a unique perspective to the classroom that can enrich the learning experience of everyone.

In this course we strive to follow the Colorado State University Principles of Community (Inclusion, Integrity, Respect, Service and Social Justice) and welcome spirited discussion, lively debate and pursuit of knowledge in a manner that respects each of us as individuals. Also see Supplementary Syllabus Information below.

Lectures:

Lectures will typically be made available (in PDF format) on Canvas shortly after presentation of the material in class.

Readings:

Readings are meant to provide background on the topics to be covered, familiarize students with primary literature, and to encourage participation in the classroom. Readings will largely be based scientific articles made available on Canvas (see Paper Discussions below)

Supplementary reading is also recommended by not required in the below textbooks:

Coleman, D.C., Callaham, M.A. Jr., and Crossley, D.A. (2018) Fundamentals of Soil Ecology, 3rd Edition, Academic Press.

Orgiazzi, A., Bardgett, R.D., Barrios, E. et al. (2016) Global Soil Biodiversity Atlas, European Commission, Publications office of the European Union (available on Canvas)

Course Assignments

Paper/Reading Discussion:

Students will work in small groups to lead discussions on selected readings throughout the semester. This will involve reading the paper (typically peer-reviewed research articles) carefully and facilitating a discussion based on its content and relevance. The paper will be selected and made available to the class at least one week prior to the discussion.

Concept Paper:

During the first half of the semester students will develop a short concept paper (pre-proposal) for a research project related to an important topic in soil ecology. The idea of a concept paper is to persuade a funding agency/donor to provide financial support for your proposed research. The paper needs provide adequate background, explain the need for the research, provide clear objectives and a plan for achieving those objectives. Concept papers can be challenging since they are generally quite short (i.e., 2-3 pages), but must convey enough information to provide a convincing argument to the funding agency. We will rely on peer-review to help improve to overall quality of your concept papers. Additional details will be provided in class.

Class Presentation:

Each student will also give a 12-15 min presentation (individually or in pairs) during the second half of the semester. Presentations will focus an important ecosystem process in soils that is strongly influenced by soil organisms. Additional detail will be provided in class.

Laboratory Component:

Students will gain experience in methods to evaluate different groups of soil organisms as well as soil processes/properties through demonstrations and hand-on activities.

Additionally, students will work in groups to conduct a replicated greenhouse experiment to understand how soil communities and key ecosystem processes (e.g., plant productivity) are influenced and interact under different experimental soil treatments. Each group will be

responsible for a set of plants and for collecting all data associated with their experimental units throughout the semester. At the end of the semester this data will be combined and each group will write up a short lab report in the format of a scientific paper that describes the background and rationale for the study, methods, results and a brief discussion/interpretation of the findings.

Participation:

You are expected to participate regularly in class discussions, evaluation of research articles, peer evaluations, laboratory activities and group assignments.

Evaluation/Grading

Grades will be based on the below distribution of course components. Grades will be assigned according to the table at the right.

Concept Paper	30%
Presentation	25%
Lab Report + Data	20%
Paper Discussion Lead	10%
Participation	15%

Final grade assignment	
Grade	**Grade cutoffs**
A+	96.5%+
A	92.5
A-	89.5
B+	86.5
B	82.5
B-	79.5
C+	77.5
C	72.5
C-	69.5
D+	66.5
D	62.5
D-	60

Administrative Notes

All assignments have firm due dates and times. Anything turned in after the class period in which it is due will be counted as late and downgraded 10% per day.

All assignments must be turned in as **hard copy** unless noted otherwise. Please do not send assignments via email, as they will generally not be accepted unless there are special circumstances and you get permission beforehand.

Recognizing that students sometimes have special circumstances, I will consider **extensions** on assignments, within reason, **when they are requested prior to the due date**.

If you do not already, please be sure to check your CSU **email** regularly, as important announcements will occasionally be communicated via the class email list.

Academic dishonesty will not be tolerated! This includes copying other student's work, plagiarism of any kind, cheating, etc. (see Supplementary Syllabus Information below).

Lecture and Lab Schedule:

Below is a **tentative** schedule for the lectures, laboratory activities and assignments. Changes will be announced in class and on the Syllabus in Canvas.

Week	Dates	Lecture Topics	Lab Activities	Assignments Due
1	Jan 22 & 24	Course intro + Soil Environment	Prep Greenhouse Experiment	
2	Jan 29 & 31	The Soil Environment	Start Greenhouse Experiment	Concept Paper Topic Due
3	Feb 5 & 7	Rhizosphere Ecology	Paper Discussion 1	
4	Feb 12 & 14	Microbial Communities	Lab Demonstration	
5	Feb 19 & 21	Soil Fauna Intro	Paper Discussion 2	Draft Concept Paper
6	Feb 26 & 28	Nematodes	Lab Demonstration	Concept Paper Peer Reviews
7	Mar 5 & 7	Other Soil Mesofauna	Lab Demonstration	
8	Mar 12 &14	Soil Macrofauna	Paper Discussion 3	Final Concept Paper
9	Mar 19 & 21	*Spring Break – NO CLASS*	No Lab	
10	Mar 26* & 28*	Soil Research Methods	Harvest Greenhouse Experiment	
11	April 2 & 4	Soil Health and Ecosystem Services	Paper Discussion 4	Presentation Topic Due
12	April 9 & 11	Soil Ecology Concepts	Sample Processing	
13	April 16* & 18	Decomposition and SOM dynamics	Lab Demonstration + Sample Processing	
14	Apr 23* & 25	Stable Isotopes in Soil Ecology	Student Presentations	GH Experiment Data due
15	Apr 30 & May 2	Data Analysis and Interpretation	Student Presentations	
16	May 7 & 9	Applications of Soil Health	Student Presentations	
Finals	May 14	*No Class*		Final Lab Report

* Students tentatively expected to stay an hour late on these days (changes will be announced in class)

Supplementary Syllabus Information

Adapted from materials provided by Matt Camper (College of Agricultural Sciences)

--- Principles of Community ---

In this course we strive to follow and extend Colorado State's University's Principles of Community, and welcome spirited discussion, lively debate and pursuit of knowledge in a manner that respects each of us as individuals.

The Principles of Community support the Colorado State University mission and vision of access, research, teaching, service and engagement. A collaborative and vibrant community is a foundation for learning, critical inquiry, and discovery. Therefore, each member of the CSU community has a responsibility to uphold these principles when engaging with one another and acting on behalf of the University.

Inclusion: We create and nurture inclusive environments and welcome, value and affirm all members of our community, including their various identities, skills, ideas, talents and contributions.

Integrity: We are accountable for our actions and will act ethically and honestly in all our interactions.

Respect: We honor the inherent dignity of all people within an environment where we are committed to freedom of expression, critical discourse, and the advancement of knowledge.

Service: We are responsible, individually and collectively, to give of our time, talents, and resources to promote the well-being of each other and the development of our local, regional, and global communities.

Social Justice: We have the right to be treated and the responsibility to treat others with fairness and equity, the duty to challenge prejudice, and to uphold the laws, policies and procedures that promote justice in all respects.

--- Need Help? Rams Take Care of Rams ---

Reach out and ask for help if you or someone you know is having a difficult time. Always feel free to come and talk to me; I will always make myself available to help connect you with any resources you need. CSU is a community that cares for you. If you are struggling with drugs or alcohol and/or experiencing depression, anxiety, overwhelming stress or thoughts of hurting yourself or others please know there is help available. Counseling Services has trained professionals who can help. Contact 970-491-6053 or go to http://health.colostate.edu. If you are concerned about a friend or peer, tell someone by calling 970-491-1350 (or visit http://safety.colostate.edu/tell-someone.aspx) to discuss your concerns with a professional who can discreetly connect the distressed individual with the proper resources. Rams take care of Rams.

This course will adhere to the Academic Integrity Policy {Section 1.6} of the Colorado State University General Catalog, the Student Conduct Code, and University Principles of Community.

Student Conduct Code: http://www.conflictresolution.colostate.edu/conduct-code.aspx#conduct

Colorado State University General Catalog: http://www.catalog.colostate.edu/

--- Classroom Etiquette ---

Please silence your phone and other electronic devices during class.

Please be quiet while in class. It can be difficult to hear in a classroom and even quiet talking can be very disruptive to other students who are trying to listen.

No animals are allowed in the classroom except those defined in the CSU policy regarding SERVICE animals (see pages _____ of this syllabus). No emotional support animals are allowed in class.

Please do not read newspapers, text, play games, or listen to music during class. It may not impact your learning experience, but it is distracting to others in the room.

--- Library Help ---

Renae Watson is the librarian supporting this course. Contact her for assistance at renae.watson@colostate.edu / ph. 970-491-5338. See her research guide at libguides.colostate.edu/agriculture. Additionally, the CSU Libraries Help Desk provides both research (ph. 970-491-1841) and technical (ph. 970-491-7276) support. These services are free for all CSU students and can be extremely helpful as you prepare your final project.

--- Title IX: Sexual Assault, Sexual Violence, Sexual Harassment ---

CSU's Discrimination, Harassment, Sexual Harassment, Sexual Misconduct, Domestic Violence, Dating Violence, Stalking, and Retaliation policy designates faculty and employees of the University as "Responsible Employees." This designation is consistent with federal law and guidance, and requires faculty to report information regarding students who may have experienced any form of sexual harassment, sexual misconduct, relationship violence, stalking or retaliation. This includes information shared with faculty in person, electronic communications or in class assignments. As "Responsible Employees," faculty may refer students to campus resources (see below), together with informing the Office of Support and Safety Assessment to help ensure student safety and welfare. Information regarding sexual harassment, sexual misconduct, relationship violence, stalking and retaliation is treated with the greatest degree of confidentiality possible while also ensuring student and campus safety.

Any student who may be the victim of sexual harassment, sexual misconduct, relationship violence, stalking or retaliation is encouraged to report to CSU through one or more of the following resources:

-Emergency Response 911

-Deputy Title IX Coordinator/Office of Support and Safety Assessment (970) 491-1350

-Colorado State University Police Department (non-emergency) (970) 491-6425

Please Visit: http://oeo.colostate.edu/title-ix-sexual-assault for more information.

--- Service Animals in the Classroom ---

This course will follow all of the policies regarding service animal access to the classroom. The full university policy may be found here: http://policylibrary.colostate.edu/policy.aspx?id=747 .

POLICY STATEMENT
The University will not discriminate against individuals with disabilities who use service dogs, nor, subject to the terms of this Policy, deny those persons access to programs, services and facilities of the University. In addition, only under certain limited conditions as stated in this policy, the University may permit an individual with a documented disability to have an Emotional Support Animal in a University residential facility. Pets are not permitted in any University building, including residence halls, except for the Veterinary Teaching Hospital and other veterinary facilities in accordance with their rules and policies, or when otherwise specially allowed with advance approval from Environmental Health Services for bona fide academic or University business purposes.

Service Dogs
Subject to some limitations, a service dog may accompany an individual with a disability throughout campus, such as in classrooms, recreational facilities and campus residences. It is strongly encouraged, but not required, that a service dog be identifiable to others through a visible signifier (e.g., vest or harness). Individuals with a disability who require a service dog in the classroom should contact Resources for Disabled Students (RDS) for assistance with accommodations.

Emotional Support Animals
An emotional support animal (ESA) is one that alleviates one or more identified symptoms or effects of a person's disability. ESAs are not permitted in university buildings, except in the rare situation where use of an ESA in University housing is approved in advance by the University upon the submission of appropriate documentation, as set forth in this policy.

ESAs are not permitted in non-residential buildings such as classrooms, laboratories, business offices, recreational facilities, dining halls, or the Lory Student Center; they are limited to the disabled individual's residence in a University residence hall, apartment, or other housing unit, and permitted only with prior approval.

--- Plagiarism and Academic Integrity ---

We take the issue of academic integrity very seriously in this course. You are expected to do your own work and to not access notes or the web during an exam, copy from someone else's exam or to provide exam answers to another student during an exam. We reserve the right to proctor all exams and will take actions to ensure that all students are following this policy.

Plagiarism
"Plagiarism includes the copying of language, structure, ideas, or thoughts of another, and representing them as one's own without proper acknowledgment. Examples include a submission of purchased research papers as one's own work; paraphrasing and/or quoting material without properly documenting the source" (CSU Policies and Guiding Principles, 2017-2018).

Our motivation for rigorously enforcing a no-plagiarism policy is twofold: First, plagiarism is a form of theft. Taking someone else's words or ideas without attribution is stealing someone else's work. Second, copying someone else's work does not fulfill the purpose of the assignment, which is for you to develop critical thinking and analysis skills. You demonstrate this by presenting your own, new, synthesis and analysis in your writing. Simply copying or paraphrasing from source materials does not demonstrate this, however insightful the source(s) may be. Good writing generates new knowledge. This should be your goal in this class, in other courses at CSU and in your career after you leave here.

In this course all written work will be spot checked for plagiarism issues by both instructors and originality checking software such as VeriCite. If you are caught plagiarizing materials you will receive a 0 for the assignment/exam/project, and depending upon the severity of the offense, an F in the course. All examples of plagiarism or academic dishonesty and will be reported to the Office of Conflict Resolution and Student Conduct Services for additional disciplinary action as outlined in the student handbook under the heading "academic integrity/Misconduct" (http://catalog.colostate.edu/general-catalog/policies/students-responsibilities/).

--- Canvas Email System Utilization ---

Using the University's systems or networks for personal gain; for example, by selling access to your eID or to university systems or networks, or by performing work for profit with university resources (e.g. selling your notes or promoting a personal agenda) in a manner not authorized by the University is strictly forbidden within the CSU Code of Conduct and also CSU's policy for Acceptable Use for Computing and Networking Resources. All cases of this type of code violation will be reported to the Office of Conflict Resolution and Case Management and dealt with following CSU legal counsel guidance.