Introduction to Soil and Biogeochemistry (BSC-423-01W)

BSC-423-01W Introduction to Soil and Biogeochemistry

COURSE SYLLABUS: Fall 2024

INSTRUCTOR INFORMATION

Instructor: Dr. Naima Khan, PhD.
Office Location: Science Building (STC), 233
University Email Address: Naima.Khan@tamuc.edu

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

Textbook(s) Recommended: Reddy, K. R., DeLaune, R., & P. W. Inglett. (2022). *Biogeochemistry of Wetlands: Science and Applications.*
Optional Texts and/or Materials: Handouts and Academic worksheets

Course Description

This course is designed to provide an overview of active biological (microbes) and chemical (carbon, oxygen, nitrogen, phosphorus, sulfur, iron, manganese) phenomena in different geo (soil) media (wetland soil, riparian soil etc.).

Instructional Method: **The course is in online.**

Student Learning Outcomes

Learning Outcomes:

1. **Critical Thinking:** The biogeochemistry of soil investigates processes that drive the environmental cycles of matter, nutrients, and energy through time and space. This undergraduate course mainly introduces the physico-chemical and microbial nutrient transformations and exchange processes in soil and water, for example food-water-energy exchange nexus. In summary, students will receive in depth knowledge of biogeochemical properties of the major global systems (terrestrial, atmospheric, and oceanic systems), biogeochemical cycles of carbon, nitrogen, phosphorus, and sulfur, and patterns of productivity, pollution, and consequences of environmental change from local to regional to global scale.

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2. **Communication:** In written, oral, and/or visual communication, students will communicate in a manner appropriate to audience and occasion, with an evident message and organizational structure. The course is designed to present one biogeochemical cycle per student at the end of the semester where students will describe the how that chemical will transport or cycle throughout all spheres (hydrosphere, biosphere, lithosphere, atmosphere) in an equilibrium environment. Class presentation will help students to exchange their research findings on a specific biogeochemical cycle to the whole class.

3. **Teamwork**: Students will be able to work together toward a shared purpose relevant to the course or discipline with a sense of shared responsibility for meeting that purpose. Students must do their group study to develop a report for their preselected biogeochemical cycle. Students will learn how to work in a group, how to distribute workload among group members, and finally how to solve problems in a group.

4. **Empirical and Quantitative Skills:** Students will be able understand and utilize mathematical functions and empirical principles and processes. There are calculations on how to measure the nutrient flux or nutrient budget for different wetland soil.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Algebra, engineering math, basic chemistry.
In addition, using the learning management system, using Microsoft Word and PowerPoint, using presentation and graphics programs, etc.

Instructional Methods

Conducting lectures, resorting to videos and visual-aid presentations, e.g., “PowerPoint” and “You tube”, solving math problems together with the students in the classroom, expecting student participation in the classroom discussions, assigning Exams and homework assignments, etc.

Student Responsibilities or Tips for Success in the Course

Turn-in all the assigned academic work; actively participate in verbal discussions; take notes and copy written explanations during class periods; take assigned written Exams; log into the course website, regularly; complete the assigned weekly study.

Learning strategies

Lectures
Reading assignments to be discussed in class
Analysis of Case Study Samples
Individual work, analysis of free reading Homework

Assumptions, Expectations, Philosophy

University students are a select group of students soon to be professionals.
Instructors can have high expectations of student performance.
Demanding courses benefit students more than easy courses.

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Assignments are due on time unless you have made a prior arrangement with me (only granted for unusual or extenuating circumstances and in case of health issues proper medical excuse is required.

Come to pre-decided class prepared, having read and thought about the assigned readings; course materials are meant to be studied, not merely read. Actively participate in class discussions; ask questions.

In university, a lot of your learning will occur outside of the classroom, during your own research, and in formal and informal interactions with your peers– both here and at meetings, correspondence, etc. Therefore, I expect you to take full advantage of ALL learning opportunities, including seminars and invited speakers.

Reading and assimilating information is a critical part of your current and continuing education. This will help you become a better writer, a more rounded individual, and expose you to subjects outside of your immediate knowledge.

GRADING

Final grades in this course will be based on the following scale: **A**= 90%-100%; B = 80%-89%; C = 70%-79%; D = 60%-69%; F = 59% or Below

Tentative course outline

Date	**Topics (Book Chapters)**	**Subtopics**
Aug 26 – Sept 20	Module–I: Biogeochemical characteristics of soils or wetland soils Module–II: Electrochemical properties of wetland soils	
Aug 26 and Sept 20, 2:00 PM ----- Online class need to attend in zoom		
Sept 23 (Exam and quiz will remain open until Sept 26)	Quiz-1 Exam 1	
Topics Quiz - 1 & Exam - 1		
Sept 27 – Oct 27	Module-III: Biogeochemistry of carbon Module-IV: Biogeochemistry of oxygen Module-V: Biogeochemistry of nitrogen	
Oct 28th -Oct 30th	Quiz 2 & Exam 2	
Oct 25th and Oct 31st, 2:00 PM ----- Online class need to attend in zoom		
Oct 31st – Nov 22rd	Module-VI: Biogeochemistry of phosphorus Module-VII: Biogeochemistry of iron and manganese Module-VIII: Biogeochemistry of sulfur	
Nov 25-26 Nov 27-29	Quiz 3 Thanksgiving break	
Nov 8th and Nov 25th, 2:00 PM ----- Online class need to attend in zoom		

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Dec 1-Dec 4	**Assignment discussion**	
December 5	Final submission of assignment	
Dec 7-13 Final week	Exam 3 (final exam)	

Assignment Guideline:

1. Find out a peer reviewed journal on your decided nutrient's biogeochemical cycle for a specific location.
2. Write a summary of the paper
3. Write the strengths and gaps/weakness of the paper
4. What future work you think will be needed or What will be your suggestion/recommendation for the paper?

Assignment Guideline:

3-5 pages, double space, 12 fonts, Time New Roman/Calibri.

Assignment Rubric:

a. Finding a strong journal: 2 points
b. Summary writing skill: Introduction sentence, body paragraph, conclusion & implication information. 5 points
c. Strength & Weakness writing skill: 2points
d. Recommendation for future work: 1 point

Assessments

Exam:

There will be a total of 3 **exams, 3 quizzes, and 1 assignment** for the course. Exams will be designed to evaluate the student's understanding of the subjects covered in class and empirical and quantitative skills. Study guide will be given to help you prepare for exams.

The paper must be sent to assignment submission folder in D2L on or before the deadline. Plagiarized papers will receive a zero score!

Grades Distribution:

3 Quizzes (10% each x 3 = 30 %)

3 Exams (20 % each x 3 = 60 %)

One (1) Assignment (10%)

Course Requirements and Evaluation Methods:

Assignment, quizzes, exams, and assignment are required.
Penalty enforcement (I reserve the right to adjust your grade for violation of the minimum expectations).
Make-up exams will only be given if arrangements are made with the instructor before missing the scheduled exam. A documented excuse will be required.
Otherwise, missing academic work will be counted as zeroes in the overall grade computation

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COURSE AND UNIVERSITY PROCEDURES/POLICIES

NOTE #1: Late assignments are not accepted. Very, very extreme circumstances may or may not provide a warranted exception. This course moves very fast and there is not enough time to catch up. In case of extreme circumstances, I may accept late work. However, 10 points will be deducted from late assignments. Research Written Report and Oral Presentation: Each student will choose 1 type of treatment technology. The guidelines for the Written Report and Oral Presentation are in "D2L".

NOTE #2: Missed Homework and Exams are not acceptable. Very, very extreme circumstances may or may not provide a warranted exception. This course moves very fast and there is not enough time to catch up. In case of extreme circumstances, I may accept let you take a missed Exam or submit a missed Homework. However, 20 points may be deducted from the missed Exam or from the missed Homework.

Overall Weighted Average Grade will be computed by adding the percentage of each grade earned from each assignment, as stated on the Course Grading table, shown above. **ONLY** unofficial grades will be posted on D2L. Official grades are in my grade book. It is most strongly recommended that each student retain their grades until the final grade has been entered into the university system to ensure all was recorded correctly.

TECHNOLOGY REQUIREMENTS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo. Below are technical requirements

LMS Requirements:
https://community.brightspace.com/s/article/Brightspace-Platform-Requirements

LMS Browser Support:
https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_suppo rt.htm

YouSeeU Virtual Classroom Requirements: https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-SystemRequirements

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu**.**

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor.

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Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

https://community.brightspace.com/support/s/contactsupport

Interaction with Instructor Statement

Weekdays: 1-24 hours; Evenings, Weekends: 5-~48 hours

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.
http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.as px

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:
https://www.britannica.com/topic/netiquette

TAMUC Attendance

For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01.
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedur es/13students/academic/13.99.99.R0.01.pdf

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedur es/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

Graduate Student Academic Dishonesty 13.99.99.R0.10

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http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Gee Library- Room 132
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu
Website: Office of Student Disability Resources and Services
http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url: http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M Commerce campuses. Report violations to the University Police Department at 903886-5868 or 9-1-1

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AI use in course [Draft 2, May 25, 2023]

Texas A&M University-Commerce acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors 'guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

13.99.99.R0.03 Undergraduate Academic Dishonesty
13.99.99.R0.10 Graduate Student Academic Dishonesty