Kimbell School of Geosciences

Course Syllabus: Groundwater Hydrology

McCoy College of Science, Mathematics, and Engineering

GEOS 4233-101 | Fall 2024

Bolin 115 MW: 5:00-5:50 PM | Lab Bolin 105 F: 1:00-2:50

Contact Information

Instructor: Dr. Jonathan D. Price
Pronouns: he/him
Office: Pierce 207
Office hours: M 3-4:50 PM | T 10-11 AM | W 1-2:50 PM by appointment
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Course Objectives

- Introduce students to the nature of water-rock interactions
- Familiarize students with the fundamentals of solution chemistry as applied to aquifers and their surroundings
- Evaluate and explore models of groundwater retention and movement
- Provide tools for examining groundwater systems
- Examine current groundwater usage at several scales
- Assess existing and newly acquired data on specific aquifers
- ***Graduate credit*** *permits an additional level of analysis, application, evaluation, and knowledge synthesis.*

Textbook & Instructional Materials

Required:
PRACTICAL PROB.IN GROUNDWATER HYDRO.+CD
Blair and Lahm lab book on Groundwater Hydrology
ISBN: 9780131456679

A USB drive

Recommended:
APPLIED HYDROGEOLOGY
The 5th edition of C.W. Fetter's seminal text on groundwater characterization
ISBN: 9781478646525

Room

Bolin 115 is the meeting room/Labs in 105.

Student Handbook

Refer to: Student Handbook

Academic Misconduct Policy & Procedures

Academic Dishonesty: Cheating, collusion, and plagiarism (the act of using source material of other persons, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work not the individual's to whom credit is given). Additional guidelines on procedures in these matters may be found in the Office of Student Conduct.

Grading

Table 1: Assignment weights

Assignments	Percent
Research activities	20%
Exam 1	18%
Exam 2	22%
Lab assignments	30%
Field trip	10%

Table 2: Total percentage points for final grade.

Grade	Points
A	90+
B	80 to 89.9
C	70 to 79.9
D	60 to 69.9
F	Less than 60

Work submission

Assignments may be remitted to the professor through 2DL or in person..
Note: You may not submit a paper for a grade in this class that already has been (or will be) submitted for a grade in another course, unless you obtain the explicit written permission of me and the other instructor involved in advance.

Exams

Exam 1 will be a 50-minute test covering the first half of the semester. Exam 2 will be a 2-hour comprehensive test, covering the entire semester. Format details will be provided prior to the exams.

Projects Required

In addition to the practical lab assignments, the class affords several opportunities to collect and evaluate data. This will result in a series of components that eventually combine into a final project. Details to follow.

Graduate credit requires a leading role in group work associated with the projects, as well as an additional original component. Additionally, the writing style and content of the project will be evaluated at a graduate level.

Colloquium

Anticipating candidate research presentations for our open position in environmental geology. These are likely to touch on attributes relevant to this class. Attendance will be mandatory.

Late Work

Late submitted assignments are the bane of our mutual existence: they are disadvantageous to you, because you fall behind the class. They are detrimental to the class, because they hold up my grading. They are disconcerting to me, because they require my reexamination of a previously graded assignment.
In an attempt to prevent tardy assignments, you will receive 10% points on the assignment for handing it in at the due time. Any late submission will result not receive this 10%. You will continue to lose 10% for each week the assignment remains late. In effect, you lose a letter grade each week your assignment is late.
Needless to say, this will not be an issue if you complete your assignments well ahead of the due date.

Desire-to-Learn (D2L)

Extensive use of the MSU D2L program is a part of this course. Each student is expected to be familiar with this program as it provides a primary source of communication regarding assignments, examination materials, and general course information. You can log into D2L through the MSU Homepage. If you experience difficulties, please contact the technicians listed for the program or contact your instructor.

Attendance

Students are expected to attend all meetings of the classes in which they are enrolled. Students are graded on intellectual effort and performance rather than attendance, but absences or tardiness from lecture may result in a lower grade. ***Note: you are still responsible for missed assignments and quizzes (most labs will include an assignment or quiz).***

Furthermore

Groundwater hydrology ranks among the most challenging classes within the geosciences. It covers a number of abstract concepts. It incorporates attributes of computational modeling, hydraulics, and chemistry. It relies heavily on largely non-intuitive, frequently arcane, and always cumbersome nomenclature. In short, plan on spending a good portion of each week on this class.

Change of Schedule

A student dropping a course (but not withdrawing from the University) within the first 12 class days of a regular semester or the first four class days of a summer semester is eligible for a 100% refund of applicable tuition and fees. Dates are published in the Schedule of Classes each semester.

Refund and Repayment Policy

A student who withdraws or is administratively withdrawn from Midwestern State University (MSU) may be eligible to receive a refund for all or a portion of the tuition, fees and room/board charges that were paid to MSU for the semester. HOWEVER, if the student received financial aid (federal/state/institutional grants, loans and/or scholarships), all or a portion of the refund may be returned to the financial aid programs.

Learning environment

Dr. Price is committed to providing an equitable and inclusive forum for learning and endeavors to keep this class an open, supporting, and safe space for all students. He is available and willing to address your issues and concerns. He also wants you to be aware of the following supporting structures that assist in this environment.

MOSAIC Center for Community & Belonging: a "To cultivate a sense of belonging for all students at MSU Texas by facilitating student access to critical resources and opportunities, supporting student success and advocating for constant improvement in the way we meet students' needs across our campus." https://msutexas.edu/student-life/mosaic/index.php

Policies for general student complaints are available at https://msutexas.edu/student-life/dean/general.php. General student complaints should start with the informal process form https://cm.maxient.com/reportingform.php?MSUTexas&layout_id=4

Sexual misconduct is handled by the Title IX Coordinator, and misconduct information and reporting is https://msutexas.edu/titleix/

Anonymous complaints can be made through EthicsPoint: https://secure.ethicspoint.com/domain/media/en/gui/45483/index.html

Grade Appeal Process

Update as needed. Students who wish to appeal a grade should consult the Midwestern State University Undergraduate Catalog

Services for Students with Disabilities

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Midwestern State University endeavors to make reasonable accommodations to ensure equal opportunity for qualified persons with disabilities to participate in all educational, social, and recreational programs and activities. After notification of acceptance, students requiring accommodations should make application for such assistance through Disability Support Services, located in the Clark Student Center, Room 168, (940) 397-4140. Current documentation of a disability will be required in order to provide appropriate services, and each request will be individually reviewed. For more details, please go to Disability Support Services.

University-Wide Policies

Campus Carry

Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. The new Constitutional Carry law does not change this process. Concealed carry still requires a License to Carry permit, and openly carrying handguns is not allowed on college campuses. For more information, visit Campus Carry.

Active Shooter

The safety and security of our campus is the responsibility of everyone in our community. Each of us has an obligation to be prepared to appropriately respond to threats to our campus, such as an active aggressor. Please review the information provided by MSU Police Department regarding the options and strategies we can all use to stay safe during difficult situations. For more information, visit Safety / Emergency Procedures.

Grade Appeal Process

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Illness

Covid-19 and the emergence of new strains remains a concern. The instructor would appreciate your thoughtful engagement of the class, including respecting the health, safety, and concerns of your colleagues. As always – illness is an excused absence.

Notice

Changes in the course syllabus, procedure, assignments, and schedule may be made at the discretion of the instructor.

Course Schedule

Wk	Event	Date	Topic	Reference
	Lecture	8/26/2024	Class intro	Fetter 1
1	Lecture	8/28/2024	1a. Orientation/ Intro to water	Fetter 1
	Lab	8/30/2024	No lab (grads have training)	none
2	Lecture	9/4/2024	1b. Water use	Fetter 2
	Lab	9/6/2024	Porosity & Framework	B&L 1
	Lecture	9/9/2024	2a. Hydrocycle	Fetter 2
3	Lecture	9/11/2024	2b. Infiltration and outflow	Fetter 2
	Lab	9/13/2024	Well data / Porosity & Framework	B&L 1
	Lecture	9/16/2024	3a. Aquifer properties	Fetter 3
4	Lecture	9/18/2024	3b. More Aquifer properties	Fetter 3
	Lab	9/20/2024	Ant Farm (analog model)	See D2L

Wk	Event	Date	Topic	Reference
	Lecture	9/23/2024	Ant Farm (analog model)-groups	See D2L
5	Lecture	9/25/2024	Ant Farm (analog model)-groups	See D2L
	Lab	9/27/2024	Regional	B&L 2/prbs
	Lecture	9/30/2024	Regional	B&L 2/prbs
6	Exam	10/2/2024	Midterm	See D2L
	Lab	10/4/2024	Seymour site visit	Site
	Lecture	10/7/2024	4. Flow principles	Fetter 4
7	Lecture	10/9/2024	Radial	B&L 3
	Lab	10/11/2024	Radial (continued)	B&L 3
	Lecture	10/14/2024	5. Drawdown and slug	Fetter 5
8	Lecture	10/16/2024	Projects (online org)	See D2L
	Lab	10/18/2024	Well Testing	B&L 5
	Lecture	10/21/2024	6a. Occurrence examples	Fetter 8
9	Lecture	10/23/2024	6b. Arbuckle Simpson	See D2L
	Lab	10/25/2024	Well Testing	B&L 5
S	Field trip	10/21/2024	Arbuckle Simpson	Trip
	Lecture	10/28/2024	6c. Problems in porous aquifers	Fetter 8
10	Lecture	10/30/2024	6d. Balcones BFZ	See D2L
	Lab	11/1/2024	Testing IRL	Site
	Lecture	11/4/2024	Project checkin	See D2L
11	Lecture	11/6/2024	8a. Solutions	Fetter 9
	Lab	11/8/2024	Seepage	Site
	Lecture	11/11/2024	8b. pH, Eh, ion chemistry	Fetter 9
12	Lecture	11/13/2024	Chemistry IRL	Site
	Lab	11/15/2024	Chemistry IRL	GX Lab
	Lecture	11/18/2024	9a. Quality and contamination	Fetter 10
13	Lecture	11/20/2024	9b. More contamination	Fetter 10
	Lab	11/22/2024	Contamination	B&L 6
14	Lecture	11/25/2024	10. Water Law	Fetter 11
	Lecture	12/2/2024	Reports	You
15	Lecture	12/4/2024	Reports	You
	Lab	12/6/2024	Lab completion	See D2L
Ex	Exam	12/9/2024	Final examination-3:30 PM	See D2L