

# GEOL 3302

## Intro to Hydrogeology

### Fall 2021

MWF 10:00 – 11:00 am  
VIN 146

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## Instructor: Professor Stephen Shields

Email: [stephen.shields@angelo.edu](mailto:stephen.shields@angelo.edu)  
Office Phone: 325-486-6934  
Office: Vincent 135

**Office Hours:** Monday/Wednesday 3 – 4pm; Tuesday 9 – 10:30am and 2 – 4pm; and Thursday 9 – 10:30am, and by appointment

## Course Information

### Course Description and Learning Outcomes

A quantitative overview of the hydrologic cycle including both surface and groundwater hydrology. Topics to include surface water, aquifer properties, groundwater, modeling, human use and abuse of water resources, contamination, and extraction. This course encompasses the occurrence, movement, and quality of fresh water in the water cycle, including environmental problems and possible solutions. Case studies will be explored in part through readings and field trips.

### LEARNING OUTCOMES & ASSESSMENT

1) To practice techniques used in the field of hydrology/hydrogeology. Many of these are applicable to other fields. Some problem-solving techniques that you will learn and practice:

- a. Field applications of hydrology: surface water
- b. Field applications of hydrology: water from wells and groundwater
- c. Researching topics of hydrology/hydrogeology
- d. Quantifying water flow and discharge using mathematics
- e. Applying Darcy's Law of flow

- f. Working in groups for field trip activities, in-class activities, and research assignments
- g. Reading scientific literature and writing professional reports
- h. Carefully defending your thinking when answering questions.

2) To learn the practical and theoretical applications of surface hydrology and subsurface hydrology.

3) Learn about the water resources of Texas.

These learning outcomes are all assessed through exams, field trip assignments, research reports, and in-class activities.

## **Course Delivery**

### **In-Person Delivery**

Hydrogeology is an extremely hands-on course, where in-class participation is necessary. We will move through content quickly, so it is important to be in class to ask questions. There will be weekly in-class activities that will be finished outside of class as homework. It is imperative you attend the introduction of these assignments.

I will not be recording the lectures. All in-class materials will be posted to [Blackboard](#).<sup>1</sup> prior to class. If you miss class, it is your responsibility to follow up with a classmate or me to get the information you missed.

### **Mandatory Field Trips**

Off-Campus: There will be a mandatory 1-day weekend field trip. Cristoval stops and Caverns of Sonora.

On-Campus: You and a partner will collect water level data on a specific date(s) during the semester.

## **Required Texts and Materials**

### **Course Materials**

**Text:** No required material to purchase. Textbook(s) will be posted as a pdf to Blackboard

**Supplementary Readings:** Papers of interest will be found in a folder on Blackboard.

## Technology Requirements

No special requirements are necessary. I expect you are checking your email and the Blackboard course page every day for announcements and postings of new material.

## Communication

I will respond to email and/or telephone messages within 24 hours during working hours Monday through Friday. Weekend messages may not be returned until Monday.

**Written communication via email:** All private communication will be done exclusively through your ASU email address. Check frequently for announcements and policy changes. In your emails to faculty, include the course name and section number in your subject line.

**Virtual communication:** Office hours and/or advising may be done with the assistance of the telephone, Collaborate, Skype, etc.

## Grading

### Evaluation and Grades

Course grades will be determined as indicated in the table below.

Assessment	Percent of Total Grade
Group Project and Presentation	7
Individual Written Report	7
Activities/Assignments	30
Midterm Project	15
Mini-Exams (x3)	21
Final Project	20
<b>Total</b>	<b>100%</b>

### Grading System

Course grades will be dependent upon completing course requirements and meeting the student learning outcomes.

The following grading scale is in use for this course:

- A = 90.00-100 %
- B = 80.00-89.99 %
- C = 70.00-79.99 %
- D = 60.00-69.99 %
- F = 0-59.99 %

## Assignment and Activity Descriptions

All materials will be made available on Blackboard. All late submissions are subject to point deductions. Below is a brief description of the major assignments:

- Group project and presentation
  - USGS groundwater region summaries
- Individual written report
  - Brief literature review on groundwater topics
- Activities and assignments are presented and assigned during class hours, and completed as homework.
- Midterm project
  - Analyzing groundwater on ASU's campus and in the surrounding area
- Final project
  - Delineating groundwater contamination plumes
- Exams
  - Covering lecture material

## General Policies Related to This Course

All students are required to follow the policies and procedures presented in these documents:

- [Angelo State University Student Handbook](#)<sup>2</sup>
- [Angelo State University Catalog](#)<sup>3</sup>

## Academic Integrity

Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.

The College of Science and Engineering adheres to the university's [Statement of Academic Integrity](#).<sup>4</sup>

## Accommodations for Students with Disabilities

ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA) and subsequent legislation.

Student Disability Services is located in the Office of Student Affairs, and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student's responsibility to initiate such a request by contacting an employee of the Office of Student Affairs, in the Houston Harte University Center, Room 112, or contacting the department via email at [ADA@angelo.edu](mailto:ADA@angelo.edu). For more information about the application process and requirements, visit the [Student Disability Services website](#).<sup>5</sup> The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dr. Dallas Swafford  
Director of Student Disability Services  
Office of Student Affairs  
325-942-2047  
[dallas.swafford@angelo.edu](mailto:dallas.swafford@angelo.edu)  
Houston Harte University Center, Room 112

## **Incomplete Grade Policy**

It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 [Grading Procedures](#)<sup>6</sup> for more information.

## **Plagiarism**

Plagiarism is a serious topic covered in ASU's [Academic Integrity policy](#)<sup>7</sup> in the Student Handbook. Plagiarism is the action or practice of taking someone else's work, idea, etc., and passing it off as one's own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list.

Papers are subject to be evaluated for originality. Resources to help you understand this policy better are available at the [ASU Writing Center](#).<sup>8</sup>

## **Student Absence for Observance of Religious Holy Days**

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 [Student Absence for Observance of Religious Holy Day](#)<sup>9</sup> for more information.

## **Title IX at Angelo State University**

Angelo State University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from sex discrimination of any kind. In accordance with Title VII, Title IX, the Violence Against Women Act (VAWA), the Campus Sexual Violence Elimination Act (SaVE), and other federal and state laws, the University prohibits discrimination based on sex, which includes pregnancy, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination and unwelcome behavior of a sexual nature. The term includes sexual harassment, nonconsensual sexual contact, nonconsensual sexual intercourse, sexual assault, sexual exploitation, stalking, public indecency, interpersonal violence (domestic violence or dating violence), sexual violence, and any other misconduct based on sex.

You are encouraged to report any incidents involving sexual misconduct to the Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator, Michelle Miller, J.D. You may submit reports in the following manner:

Online: [Incident Reporting Form](#)<sup>10</sup>

Face to Face: Mayer Administration Building, Room 210

Phone: 325-942-2022

Email: [michelle.miller@angelo.edu](mailto:michelle.miller@angelo.edu)

Note, as a faculty member at Angelo State, I am a mandatory reporter and must report incidents involving sexual misconduct to the Title IX Coordinator. Should you wish to speak to someone in confidence about an issue, you may contact the University Counseling Center (325-942-2371), the 24-Hour Crisis Helpline (325-486-6345), or the University Health Clinic (325-942-2171).

For more information about resources related to sexual misconduct, Title IX, or Angelo State's policy please visit the [Title IX website](#).<sup>11</sup>

## **Information About COVID-19**

Please refer to ASU's [COVID-19 \(Coronavirus\) Updates](#)<sup>12</sup> web page for current information about campus guidelines and safety standards as they relate to the COVID-19 pandemic.

## Modifications to the Syllabus

This syllabus, including grade evaluation and course schedule, is subject to modification. In particular, the COVID-19 pandemic may require significant changes in course delivery and content on potentially short notice.

# Course Schedule

Note: Subject to change. All due date/times are in central time zone.

Week	Topic	Exam Dates
#1: 8/23 – 8/27	Basics of Geology Review	
#2: 8/30 – 9/3	Origin of water on Earth, water cycle and properties of water	
#3: 9/6 – 9/10	Water cycle and properties of water; evaporation and precipitation	
#4: 9/13 – 9/17	Watershed delineation, surface water, runoff, flooding and drought	
#5: 9/20 – 9/24	Porosity and other hydraulic properties	Exam 1 9/27
#6: 9/27 – 10/1	Hydraulic Conductivity and Darcy's Law	<del>9/26 Field Trip or...</del>
#7: 10/4 – 10/8	Groundwater movement, topography, velocity, and flow nets	Individual Reports Due 10/17
#8: 10/11 – 10/15	Groundwater Quality and Well-field design	
#9: 10/18 – 10/22	Regional Groundwater Flow	Group Project Presentations 10/18 and 10/20
#10: 10/25 – 10/29	Well Dynamics and Tests	Exam 2 10/27 10/24 Field Trip
#11: 11/1 – 11/5	Hydrologic Field Methods	
#12: 11/8 – 11/12	Groundwater Contamination	Midterm Project Due 11/12
#13: 11/15 – 11/19	Well construction Methods	Exam 3 11/19
#14: 11/22 – 11/26	Future of groundwater resources; groundwater remediation; Intro to final project	
#15: 11/29 – 12/3	Final Project	
12/6	Final Project Due: Monday Dec 6 10:30 – 12:30	Final Exam Week

<sup>1</sup> <https://blackboard.angelo.edu/>

<sup>2</sup> <https://www.angelo.edu/current-students/student-handbook/>

<sup>3</sup> <https://www.angelo.edu/academics/catalog/>

<sup>4</sup> <https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=96>

<sup>5</sup> <https://www.angelo.edu/current-students/disability-services/>

<sup>6</sup> <https://www.angelo.edu/content/files/14197-op-1011-grading-procedures>

<sup>7</sup> <https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=96>

<sup>8</sup> [https://www.angelo.edu/current-students/writing-center/academic\\_honesty.php](https://www.angelo.edu/current-students/writing-center/academic_honesty.php)

<sup>9</sup> <https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of>

<sup>10</sup> <https://www.angelo.edu/incident-form>

<sup>11</sup> <https://www.angelo.edu/title-ix>

<sup>12</sup> <https://www.angelo.edu/covid-19/>