GEOL 3302  
Intro to Hydrogeology  
Fall 2020  
MWF 11:00 – 11:50 am  
VIN 146

Instructor: Professor Stephen Shields  
Email: stephen.shields@angelo.edu  
Office Phone: 325-486-6934  
Office: Vincent 135

Virtual Office Hours (in Collaborate): Tuesday 1:00 pm – 2:30 pm, and Thursday 3:30 pm - 4:30 pm, and by appointment  
Outside (in between Vincent and Nursing Building) or Hallway Office Hours:  
Monday and Wednesday 3:30 pm - 4:00 pm; Tuesday and Thursday 9:00 am – 10:30 am, 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, and public policy as related to water supply and contamination issues.

These learning outcomes are all assessed by grades on Exams, field trip assignments, research reports, and in-class activities.

**Course Delivery**

**Asynchronous Remote Sessions**
To maintain academic quality while accommodating social distancing needs this semester, this course will use a split delivery model that combines face-to-face teaching with remote instruction.

The goal is to provide face-to-face instruction to students who want to return to campus, while also allowing students who may need to learn remotely to participate via virtual class sessions.

**How Does It Work?**
Your class will be divided and you will be placed into a smaller group of students to maintain physical distancing requirements in our assigned classroom space.

Your assigned group will receive a schedule of in-person class meetings. This schedule is not flexible. For instance, if you are supposed to attend class on a Monday, you cannot elect to go on Wednesday with another class group instead.

When you are not in the physical class, you will be responsible for completing assigned coursework in [Blackboard](https://blackboard). This work can be completed any time before the posted deadline.
Please refer to this Health and Safety web page for updated information about campus guidelines as they relate to the COVID-19 pandemic.

**Required Texts and Materials**

**Course Materials**

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

**Supplementary Readings:** Papers of interest will be found in a folder on your blackboard webpage.

**Technology Requirements**

You will be required to have a computer with a webcam with internet access for this course. You may also be required to turn in assignments on Blackboard using a scanner.

** Respondus Lockdown Browser:**

Access to exams will be through Respondus Lockdown Browser and will be video recorded via Respondus Monitor. Respondus requires a desktop computer or laptop (not a Chromebook) and a webcam. For best results, use an ethernet cable to connect to your Internet source instead of relying on Wifi. Refer to the Blackboard course for Respondus installation instructions.

**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.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Percent of Total Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily grades (attendance)</td>
<td>10</td>
</tr>
<tr>
<td>Group Project and Presentation</td>
<td>10</td>
</tr>
<tr>
<td>Individual Report</td>
<td>10</td>
</tr>
<tr>
<td>Activities/Assignments (x8)</td>
<td>40</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>15</td>
</tr>
<tr>
<td>Final Exam (cumulative)</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

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
You will be able to complete all activities in-person or remotely. All materials will be made available on Blackboard.

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](#)
- [Angelo State University Catalog](#)
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 to disciplinary action and possible expulsion from ASU.

The College of Science and Engineering adheres to the university’s Statement of Academic Integrity.

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. For more information about the application process and requirements, visit the Student Disability Services website. The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
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 for more information.
Plagiarism
Plagiarism is a serious topic covered in ASU's Academic Integrity policy 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.

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 for more information.

Title IX at Angelo State University
The University prohibits discrimination based on sex, which includes pregnancy, sexual orientation, gender identity, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination including: sexual assault, sex-based discrimination, sexual exploitation, sexual harassment, public indecency, interpersonal violence (domestic violence and/or dating violence), and stalking. As a faculty member, I am a Responsible Employee meaning that I am obligated by law and ASU policy to report any allegations I am notified of to the Office of Title IX Compliance.

Students are encouraged to report any incidents of sexual misconduct directly to ASU’s Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator at:

Michelle Boone, J.D.
Director of Title IX Compliance/Title IX Coordinator
Mayer Administration Building, Room 210
325-942-2022
michelle.boone@angelo.edu

You may also file a report online 24/7 at www.angelo.edu/incident-form.
If you are wishing to speak to someone about an incident in confidence you may contact the University Health Clinic and Counseling Center at 325-942-2173 or the ASU Crisis Helpline at 325-486-6345.

For more information about Title IX in general you may visit www.angelo.edu/title-ix.⁹

**Required Use of Masks/Facial Coverings by Students**

As a member of the Texas Tech University System, Angelo State University has adopted the mandatory [Facial Covering Policy]¹⁰ to ensure a safe and healthy classroom experience. Current research on the COVID-19 virus suggests there is a significant reduction in the potential for transmission of the virus from person to person by wearing a mask/facial covering that covers the nose and mouth areas. Therefore, in compliance with the university policy students in this class are required to wear a mask/facial covering before, during, and after class. Faculty members may also ask you to display your daily screening badge as a prerequisite to enter the classroom. You are also asked to maintain safe distancing practices to the best of your ability. For the safety of everyone, any student not appropriately wearing a mask/facial covering will be asked to leave the classroom immediately. The student will be responsible to make up any missed class content or work. Continued non-compliance with the Texas Tech University System Policy may result in disciplinary action through the Office of Student Conduct.

**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.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Exam Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1: 8/17 – 8/21</td>
<td>Basics of Geology Review</td>
<td></td>
</tr>
<tr>
<td>#2: 8/24 – 8/28</td>
<td>Origin of water on Earth, water cycle and properties of water</td>
<td></td>
</tr>
<tr>
<td>#3: 8/31 – 9/4</td>
<td>Water cycle and properties of water; evaporation and precipitation</td>
<td></td>
</tr>
<tr>
<td>#4: 9/7 – 9/11</td>
<td>Watershed delineation, fluvial geomorphology, runoff, flooding and drought</td>
<td>Exam 1 in Blackboard (open 9/25 8am to 9/28 11:59pm)</td>
</tr>
<tr>
<td>#5: 9/14 – 9/18</td>
<td>Porosity and other hydraulic properties</td>
<td></td>
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<tr>
<td>#6: 9/21 – 9/25</td>
<td>Hydraulic Conductivity and Darcy’s Law</td>
<td></td>
</tr>
<tr>
<td>#7: 9/28 – 10/2</td>
<td>Groundwater movement, topography, velocity, and flow nets</td>
<td>Exam 1 in Blackboard (open 9/25 8am to 9/28 11:59pm)</td>
</tr>
<tr>
<td>#8: 10/5 – 10/9</td>
<td>Groundwater Quality and Well-field design</td>
<td>Group Project Presentations 10/12 and 10/14</td>
</tr>
<tr>
<td>#9: 10/12 – 10/16</td>
<td>Regional Groundwater Flow</td>
<td></td>
</tr>
<tr>
<td>#10: 10/19 – 10/23</td>
<td>Well Dynamics and Tests</td>
<td>Exam 2 in Blackboard (open 10/30 8am to 11/2 11:59pm)</td>
</tr>
<tr>
<td>#11: 10/26 – 10/30</td>
<td>Hydrologic Field Methods</td>
<td></td>
</tr>
<tr>
<td>#12: 11/2 – 11/6</td>
<td>Groundwater Contamination</td>
<td></td>
</tr>
<tr>
<td>#14: 11/16 – 11/20</td>
<td>Future of groundwater resources</td>
<td></td>
</tr>
<tr>
<td>#15: 11/21</td>
<td>Final Exam</td>
<td>Final Exam in Blackboard</td>
</tr>
</tbody>
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1. [https://www.angelo.edu/student-handbook/](https://www.angelo.edu/student-handbook/)
2. [https://www.angelo.edu/catalogs/](https://www.angelo.edu/catalogs/)
4. [https://www.angelo.edu/services/disability-services/](https://www.angelo.edu/services/disability-services/)
5. [https://www.angelo.edu/content/files/14197-op-1011-grading-procedures](https://www.angelo.edu/content/files/14197-op-1011-grading-procedures)
7. [https://www.angelo.edu/dept/writing_center/academic_honesty.php](https://www.angelo.edu/dept/writing_center/academic_honesty.php)
8. [https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of](https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of)
9. [https://www.angelo.edu/services/title-ix/](https://www.angelo.edu/services/title-ix/)