Instructor: Dr. Ross Guida E-mail: <u>ross.guida@shsu.edu</u> Office: LDB 336 Office Hours: M, T, Th 11-12; By Appt.

Lecture: MWF 10-10:50 LDB 321

Field Trips: There will be several Friday afternoon trips or extended class periods during the semester. Some of these will include applied assignments on campus, while others may involve off-campus trips to learn about hydrologic concepts as applied by professionals.

Objectives

By the end of class, students should be capable of:

- Describing each component of the water cycle in detail;
- Understanding and applying the seminal physical equations related to surface water hydrology and hydraulics, groundwater, and sediment transport;
- Conducting a flood frequency analysis;
- Explaining why hydrology is important in terms of natural/environmental hazards;
- Analyzing how hydrologic processes are important in agriculture and ecology;
- Discussing why hydrology is important to society, how it influences the human-built environment and how in turn human beings impact the natural hydrology of systems
- Measuring stream cross-sections and discharge in the field;
- Finding and interpreting journal articles;
- Researching and writing papers using a combination of sources, including peerreviewed journal articles;
- Working on applied assignments in groups;
- Developing and presenting a visually appealing and comprehensive research poster.

Required Textbook:

Ward, A.D., S.W. Trimble, S.R. Burckhard and J.G. Lyon. 2016. *Environmental Hydrology*. Taylor & Francis Group. 9781466589414.

Course Website: Non-textbook, supplemental readings will be made available as PDFs on Blackboard. Lecture notes, assignments, and supplemental readings will also be made available via SHSU Online/Blackboard. To efficiently use the time allotted for the course, I expect you to check the course page often and come to class prepared.

<u>SHSU Email:</u> Your SHSU email account is the official form of university communication, and I will use it as a primary means of communication with you. Please make sure that you maintain a valid password and regularly check your SHSU email account for important announcements.

<u>Attendance Policy:</u> Attendance in this course is mandatory. Only documented absences will be excused in accordance with university policy. Students are allowed 6 unexcused absences with no penalty or documentation. Additional undocumented absences will adversely impact your grade up to a penalty of 1% off the final grade per additional absence. While this may not seem like a large impact, every semester there are students who see their final grades impacted up to two letters. If you are unable to attend field trips, please talk to me ahead of time about why you can't make it so both you and I have

reasonable time to make accommodations for substitute assignments. For details on extended absences, please see: <u>http://www.shsu.edu/dept/dean-of-students/absence.html</u>

If you miss class, you must take the initiative to get lecture and/or discussion notes from classmates and/or go over the materials posted online. I am happy to meet during office hours to discuss questions from lectures, but my office hours are not meant for holding individual/one-on-one lectures unless there was a legitimate reason to miss class.

Should unusual circumstances arise during the semester (medical problem, death in the family, house floods, etc.) please contact me ahead of time and provide official documentation so I can work with you to accommodate the situation. Please do not wait until well after the event, the end of the semester, or until your grade has fallen as these are not sufficient reasons and may result in me not being able to make accommodations.

In addition to the above, please be on time to limit disruptions during lecture. Late arrivals will be counted as absences in accordance with the above 3 absence policy.

Grading:

Scale: A=90-100%, B=80-90%, C=70-80%, D=60-70%, F<60%

Breakdown:

Applied Assignments (7)	17.5%
Field trip reports (2)	7.5%
Final Paper + Poster and Presentation	15%
Exam 1	17.5%
Exam 2	17.5%
Final exam (Comprehensive/cumulative)	25%
	100%

Applied Assignments/Reports: Hydrology is a course that usually has an associated lab. Because this course is new, it does not have a traditional lab component yet. As such, to make sure you understand the concepts and how to apply them beyond quizzes and exams, I will be giving you assignments, and we will be taking several trips on Fridays. It is my hope that a good portion of the applied assignments will be completed in class. However, effort outside of class will be required, especially related to trips taken and classes spent outdoors. You will have at least one week to complete these exercises. LATE ASSIGNMENTS WILL NOT BE ACCEPTED WITHOUT VALID REASONS THAT MEET UNIVERSITY POLICIES.

Each Friday, please make sure you bring: The printed exercise and any related materials/readings provided for the week; a pencil; an eraser; a scientific calculator; scratch paper. You may also prefer to have a weatherproof field notebook for some of the activities and trips as this will likely help you do the assignment after class and write up reports after our trips. For homework, you may use your phone calculators, but remember, phones will not be allowed for calculations on exam days.

You are responsible for reading the assignment, notes, and reviewing lectures related to the week's topic ahead of time. This will allow for efficient use of the allotted 50 min time. It will also maximize the time for our guest speakers and field trips.

I encourage you to talk through issues with classmates, but be careful. Copying classmates' assignments (including text and/or calculations and answers) will result in a grade reduction up to being given a 0 for the assignment in question. This goes for all parties involved. *There will be exceptions for several group assignments*.

For field trips, you will write a 2-page (max text), 1.5 spaced, size 12 Times New Roman font, 1" margin paper summarizing the visit and what you learned. TAKE PICTURES! While the pictures do not count toward the total limit, they will help you discuss the trip more effectively in a limited space. A more detailed rubric will be posted on Blackboard.

As noted, you will have one week to complete all assignments unless noted otherwise in the course schedule. Assignments/reports are due immediately at the start of class on Friday. Working on the previous week's assignments during class will result in a zero grade. Additionally, if you miss class without a valid excuse, assignments will not be accepted.

Expectations for assignments: Answers should be written <u>clearly and concisely</u>. All calculations and units must be included so I can see how you worked through the problem and where there may have been errors, and points will be given for the correct answer and for showing your work. Points will be deducted for illegible handwriting and a lack of clarity in calculations.

Treat written field reports as if you're turning them into an employer who is paying you as an hourly consultant or as if you're turning them in as part of a contracted local, state, or federal report. Clear writing and reporting are always important. Further, this is a 400-level course, and I expect proofread papers with excellent grammar.

Exams: There will be three exams: two "midterm" exams and a cumulative final. Content will include readings, lectures, homework assignments, and field trip-related concepts. Questions will be multiple choice, true/false, fill-in-the-blank, matching-based, and short answer (including calculations and problems). I may also include picture slides with identification/ interpretation. The final will be comprehensive, meaning it will include important concepts and questions from before the midterm exams as well as after. All exams will include a Scantron component, so please make sure to bring 882-E forms.

There will be a short in-class review for the final. *Make-up exams will only be given in the event of an illness, family emergency, etc.* with proper documentation. Please see the link under the "attendance policy" section.

* Make sure you bring a basic scientific calculator to class as well as pencils and Scantrons for all exams. Smartphones, tablets, etc. will not be allowed during exams. Sharing of devices will also not be allowed under any circumstances. Please come prepared or be ready to do it the old-fashioned way.*

Final Papers: Due on Monday, Nov. 27th at 10 am. You will turn in a hard copy at the beginning of the class period and must also upload a digital copy (Word or PDF file) to

Blackboard by the start of class on the same date. Failure to upload a digital copy on time will result in an automatic 20% deduction from the final paper grade.

The paper format will be a maximum of 6 full pages (5 min.) of text with 12-point Times New Roman font, 1.5 spacing, margins of 1", with a full reference/bibliography at the end that does not count in the page limit. Figures and tables are highly encouraged but need to include captions and proper citations and do not count toward the page limit. Please use Chicago Style author-date format (see below) for your in-text citations and full references. This format is common in many geography, hydrology, and earth science publications. Double check your bibliography and in-text references as many citation engines have errors, and there are differences between Chicago Style and Chicago Style author-date. Work on paraphrasing the information from articles—more than three verbatim citations/quotes will not be allowed. This assignment is meant to familiarize you with distilling information down from academic sources and/or scientific reports in order to tell a coherent story.

Ex.: This would be your paraphrased sentence (Guida et al. 2016).

Guida, R.J., J.W.F Remo, and S. Secchi. 2016. Tradeoffs of strategically reconnecting rivers to their floodplains: The case of the Lower Illinois River (USA). *Science of the Total Environment* 572: 43-55. DOI 10.1016/j.scitotenv.2016.07.190

Topics must be chosen ahead of time (due Fri. 9/29). Each student should come to class with two potential surface or groundwater-related topics, along with a list of 5 relevant journal article references for each, in case there is overlap with classmates. Use the journal article search to either widen or narrow your topic/theme. You do not want a topic to be either overly broad or so specific that you have trouble finding references. Your final paper must reference a minimum of 8 different peer-reviewed articles. In place of two articles you may include federal or state-agency reports. I encourage you to look at the syllabus schedule and book in detail to find themes and geographic areas that may interest you. Topics covered in lecture are allowed, but you will be required to develop the topic in much greater detail. Some example topics for papers include:

- the impacts of urbanization on flooding in Harris County, TX;
- irrigation effects on water in the Central Valley of California;
- nutrients from agricultural watersheds and wastewater contributing to Gulf hypoxia;
- sedimentation issues in reservoirs in Western or Eastern Texas;
- levee impacts on flood risk in Louisiana;
- groundwater contamination in SE Texas;
- arsenic levels in wells in India.

The grade on your final paper will be based on a combination of: Formatting; grammar and spelling; quality of the scientific/technical writing; quality of your sources; ability to mix in references that are not verbatim quotes; overall content; how well your analyses and recommendations are sourced. I will also collect a 250-word abstract three weeks ahead of the final due date to ensure you are making progress. I will provide a rubric around the same time you turn in your topics so you know what to expect for all components.

Final Posters: In addition to the written assignment, during the last week of class, you will create a 36" x 48" poster and will give a 4-minute (maximum) presentation to share with the class what you learned about the topic. PRACTICE TO STAY WITHIN TIME! Questions and discussion will follow student presentations. Fellow students are highly encouraged to ask questions. For examples of posters, please check out the 3rd floor hallway in LDB or come talk to me in my office. A rubric will also be available online.

Summary final paper timeline/due dates:

Fri., Sept. 29 at 10 am: Pick 2 topics; provide 5 related journal article citations for each *Mon., Nov. 6 at 10 am:* Hard copy 250 word abstract due *Mon., Nov. 27 at 10 am:* Hard copy and digital copies of final papers due *Weds., Nov 29 at 10:* 36"x48" posters PDFs due (bring on jump/thumb drives); presentations during 11/29 and 12/1 class periods

SHSU Student Conduct Code: Academic dishonesty, including cheating and plagiarism, will be taken seriously. PLEASE DO NOT PLAGIARIZE OR COPY CLASSMATES ASSIGNMENTS. There will be several exceptions for team-based assignments in this class, and I encourage discussion for individual assignments, but please do not copy calculations or text verbatim for assignments that will be turned in individually. PLEASE DO NOT CHEAT ON YOUR EXAMS. These issues will result in failing the assignment or exam in question and/or the course. For more, please see the SHSU Student Conduct Code: http://www.shsu.edu/dept/dean-of-students/policies/documents/Student+Guidelines+2013-2016.pdf

Students with Disabilities: It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see: http://www.shsu.edu/dept/academic-affairs/documents/aps/students/811006.pdf

<u>Religious Holy Days:</u> If a student desires to be excused from class, assignment, or a test to participate in activities associated with a religious holy day, then the student must notify the instructor ahead of time of each scheduled class that he/she will miss for religious reasons. In such cases, the student will be required to take the test or submit the assignment early—unless there are good reasons for not being able to do so and the instructor has agreed to those reasons.

<u>Visitors in the Classroom</u>: Unannounced visitors to the classroom must present a current, official SHSU identification card to be permitted in the classroom. They must not present a disruption to the class by their attendance. If the visitor is not a registered student, it is at the instructor's discretion whether or not the visitor will be allowed to remain in the classroom. This policy is not intended to discourage occasional visiting of classes by responsible persons.

<u>Tentative</u> Course Schedule (*subject and likely to change based on multiple issues, including potential elevator fire, illness, weather, etc.*):

Class Week	Date	Торіс	Readings/Assignments
1	W 8/23	Course logistics; What is hydrology!?	Syllabus
	F 8/25	Hydrologic Cycle	Ch. 1
2	M 8/28	Precipitation	Ch. 2
	W 8/30	Precip, Hyetographs, design storms	Ch. 2
	F 9/1	Statistics for Hydrology	Ch. 1
3	M 9/4	No Class;	Ch. 3
	W 9/6	Soil Overview and Infiltration	Ch. 3
	F 9/8	1: Design Storm and Infiltration (outside)	
4	M 9/11	Evapotranspiration (AET, PET, water balance)	Ch. 4
	W 9/13	Evapotranspiration (Saturation vapor pressure and large reservoir water loss)	Ch. 4
	F 9/15	2: ET assignment	1 due
	M 9/18	Hydrogeology/groundwater; aquifers	Ch. 11
5	W 9/20	Darcy's Law, Fick's Law, Theis well function	Ch. 11
	F 9/22	Exam 1	
	M 9/25	<i>Ex. 1 review/answers</i> Groundwater modeling;	Ch. 11
6	W 9/27	Wells and groundwater management	Ch. 12.1
	F 9/29	FT 1: Groundwater and water treatment field trip (Huntsville water well and Palm St. plant)	2 due; Final paper topics w/ 5 references due
7	M 10/2	Groundwater contamination	Ch. 11
	W 10/4	Watersheds/drainage basins, hydrographs	Ch. 5
	F 10/6	3: Groundwater assignment	FT 1 due
8	M 10/9	Runoff (Curve number and partial-area model)	Ch. 5
	W 10/11	Runoff models (Unit hydrograph), measuring Q	Ch. 5
	F 10/13	No lecture – Geomorphology conference; 4: Curve number approach/watersheds	3 due
9	M 10/16	Stream basics	
	W 10/18	Stream classification; Open channel flow and hydraulics	

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	F 10/20	5: Stream measurements (Q) I (field trip to	4 due
10	M 10/23	Sediment generation and load; Coon Creek	Ch. 6
	W 10/25	Dams – Hydrology, Ecology, Sediment	Ch. 6, 7
	F 10/27	6: Stream measurements (XS) II (field trip to hatchery/field station: outside)	5 due
11	M 10/30	Flooding and flood frequency analysis	Ch. 9
	W 11/1	Flood management and planning	Articles
	F 11/3	Exam 2	6 due
12	M 11/6	Hydroecology Concepts and Theories	Articles 1 pg. Final Paper Abstracts Due
	W 11/8	Levees and flood modeling	Ch. 12
	F 11/10	7: Flood frequency assignment	
13	M 11/13	Evolution of flood policies and insurance	Articles
	W 11/15	Water law: riparian vs. prior appropriation vs rule of capture; CWA and ESA implications	Articles
	F 11/17	FT 2: Field trip to dam (Lake Conroe/San Jacinto River Authority; outside)	
14	M 11/20	Water use: withdrawals vs. consumption	7 due
	W 11/22	No Class – Thanksgiving break	N/A
	F 11/24	No Class – Thanksgiving break	
15	M 11/27	Texas State Water Plan 2017: municipal demands and planning for growth	All Final Papers Due
	W 11/29	Student poster presentations	All Final Posters Due
	F 12/1	Student poster presentations; Final Review	FT 2 due
16		Final Exam	
		Monday, Dec. 4 th	
		10:30 am – 12:30 pm	