Hydrology & Human Affairs

GLY 3882C

Course Description & Goals

Water is a resource that is vital for life, but the quality and quantity of our water resources are currently under threat. This course introduces the basic concepts of groundwater flow, its relationship to surface water, humans, and the environment, and applies those concepts to current water-related issues. By the end of this course, you should be able to:

- Describe the basic concepts of groundwater flow and its relationship to surface water, humans, and the environment.
- Apply hydrologic methods, including potentiometric surface mapping, cross-section development, and data analysis, to assess water-related problems.
- Summarize, present, and discuss hydrologic information from scientific reports and the media.

Class Format

The class is an online asynchronous course; no required course activities will be conducted "live". Optional office hours and help sessions will be offered in real time. The course consists of 10 modules completed in sequence. See Class Schedule for details.

Technology

You will need a dependable computer and internet connection to access the class content on Canvas, and a functional webcam to show the proctor a photo ID before taking exams.

Textbook:

No Required Textbook. Each module provides the required reading material or will link to resources freely available online.

Instructor

Dr. Ryan Wilhelmi

Email: message through Canvas, use rwilhelmi@ufl.edu only if necessary.

Office Location:
Virtual (will post Zoom link)

Online Office Hours:
TBA

Teaching Assistant

Keith Lawless

Email: lawlessk@ufl.edu or message through Canvas.

Office Hours:
TBA

See Canvas for Zoom link.

Important Dates

Exam 1 Window 1: 09/30 – 10/7

Synthesis Report 1: 10/14

Synthesis Report 2: 12/2

Exam 2 Window: 12/2 – 12/09

COURSE DETAILS

3 credit hours. Online. GLY 3882C is aimed at junior-level students or above. This course fulfills the UF General Education Physical Science (P) requirement, and is an International Scholars Program course (N). Technically there are no pre-requisites, but you will struggle without basic math (specifically algebra) skills, and would benefit from taking a basic geology course before this one.

Physical Science Designation: Physical science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the physical sciences. Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern physical systems. Students will formulate empirically-testable hypotheses derived from the study of physical processes, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments.

International (N) Designation: This designation is always in conjunction with another program area. International courses promote the development of students' global and intercultural awareness. Students examine the cultural, economic, geographic, historical, political, and/or social experiences and processes that characterize the contemporary world, and thereby comprehend the trends, challenges, and opportunities that affect communities around the world. Students analyze and reflect on the ways in which cultural, economic, political, and/or social systems and beliefs mediate their own and other people's understanding of an increasingly connected world.

STUDENT LEARNING OBJECTIVES (SLOs)

1. Understand the basic concepts of groundwater flow and how it is influenced by the medium (rock, sand, soil) through which it flows.
2. Describe the basic concepts of the relationship between groundwater and surface water.
3. Apply hydrologic methods, including potentiometric surface mapping, cross-section development, and data analysis, to assess water-related problems.
4. Examine the complex relationship of groundwater, the environment and human resource needs.
5. Discuss local, national and international current events in hydrology by evaluating scientific reports and news reports.
6. Synthesize and present scientific information in technical reports and presentations.

YOUR COURSE RESPONSIBILITIES

- Check the announcements and your e-mail regularly - it is the only way I can directly communicate with you in an online course.
- Complete course activities in a timely fashion.
- Abide by UF's Academic Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." See Behavior Expectations for more details.
- Respect your fellow class members and follow "Netiquette" Guidelines for online communication.

COURSE ACTIVITIES

Module Activities: Each module contains assigned readings and videos to introduce concepts and activities to help you engage with the material. Within each module:

- **Assignments** will introduce material about specific areas and/or provide practice with concepts, skills and data analysis. Your lowest assignment grade automatically drops, even if it is a zero/missing. (SLOs 1,2,3,4)
- **Discussions** provide a place to consider the implications of the material, and related real-world issues. The written posts and replies will be evaluated on how well they address the question or assignment and the quality of communication. Every other week we will start a new discussion, and you will have two weeks to complete them – one week for an initial post, and another week to follow up and interact with others. The lowest discussion grade drops. (SLOs 4,5)
- **Quizzes** for each module will review the terms and concepts from the reading and ask you to synthesize information from the assignment. The quizzes will generally be a combination of True/False, multiple choice, multiple-answer or "fill in the blank" questions. Your lowest quiz grade automatically drops. (SLOs 1,2,3)

Assessments: In addition to weekly Module activities there are presentations, exams and reports to assess your learning. Detailed information is on the class website, but to summarize:

- A **presentation** with a topic based on student interests and recent news. (SLOs 4,5,6)
- Two **Exams** (online, multiple choice or fill-in-the-blank, notes allowed). Exams are proctored through Honorlock. You will not be recorded while taking your exam, but you will need your webcam to show a photo ID to the proctor before you begin. (SLOs 1,2,3)
- Two **Synthesis Reports** will ask you to synthesize course material, scientific data, discussions and presentations to create a scientific evaluation and report of one theoretical and one real-world hydrology problem. (SLOs 1,2,3,4,5,6)

ASSIGNMENT EXPECTATIONS

Collaboration & Groupwork: Collaborating with other students to work on assignments is permitted, but you are ultimately responsible for turning in your own work, and standing by the answers you turn in. Plagiarism of other student's work or published materials is not allowed. Assignments and Synthesis Reports will be evaluated with Turnitin, an online service that identifies potential plagiarism by comparing your submission to online material, submissions from prior semesters, and submissions from current classmates. Submissions flagged by Turnitin will be evaluated for a potential honor code violation. You won't have any issues if turn in your own work in your own words!

Citations and References: You can reference material or ideas from other people. Just give credit where due and cite your sources. I'm not a stickler for which format to use for citations, as long as you are consistent and use the same format throughout an assignment.

Appropriate Use of Artificial Intelligence: AI programs are not a replacement for human creativity and critical thinking. You are free to use AI tools to enhance your understanding of the course content, but you need to be aware of the potential biases and pitfalls of AI, and its potential to both aid and suppress learning. You are responsible for ensuring that you are providing assignment responses that are high-quality, correct, and congruent with the University rules regarding academic honesty. Text generated by AI large language models is often incorrect. It is your responsibility to review and ensure the appropriateness and accuracy of assignment submissions. **If you use AI you must cite it and you must follow all standard rules for proper paraphrasing. Failure to do so will be considered cheating and will be treated accordingly.**

GRADES

There are a total of 520 points possible in the course:

- 105 pts: Best 6 of 7 Assignments @ 15 points each
- 100 pts: Best 10 of 11 Quizzes, 10 pts each; 5 pts Syllabus Quiz
- 85 pts: Best 4 of 5 Discussions, 20 points each; 5 points introduction post.
- 40 pts: Online Presentation
- 80 pts: Two Exams @ 40 points each
- 40 pts: Two Synthesis Reports @ 20 pts each

Extra Credit: Approximately 5-10 extra credit points will be available to all students at various times during the semester. Please don't request individual extra credit.

Final Grades: A minimum grade of C is required for general education credit. See https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx for UF grading policies. Final grades will be assigned with the following criteria:

Total Points	% Grade	Letter Grade	GPA Value
366 +	**90-100**	**A**	4.0
345 - 365.9	**85-89.9**	**B+**	3.5
325 - 344.9	**80-84.9**	**B**	3.0
305 - 324.9	**75-79.9**	**C+**	2.5
284 - 304.9	**70-74.9**	**C**	2.0
264 - 283.9	**65-69.9**	**D+**	1.5
244 - 293.9	**59-64.9**	**D**	1
<243.9	**< 58.9**	**E**	0

Late Policy & Missed Work: Weekly Assignments & Quizzes have a one-week grace period with no penalty. You will complete you Presentation in stages as Assignments, and those pieces do fall under the on-week grace period. However, there is a timely peer review component to Assignment 10 that makes it extremely difficult to get full credit if done late. Exams, Discussions and Synthesis will not be accepted late without permission from the TA (discussions) or Instructor (Exams & Synthesis).

Religious Observances, Military Duty & other Unavoidable Absences: Students who anticipate missing deadlines due to religious observances or other scheduled obligations must provide notice of the dates to the instructor, in writing (email is fine) at least one week in advance of the missed class days so accommodations can be made. For other unavoidable absences, contact me as soon as you know the dates. Please do not wait until after you have missed assignments to ask for an exception, as I may not be able to help - especially near the end of the semester. P.S. Personal/family vacations inside the semester don't count as an unavoidable absence!

ACCESSIBILITY & RESPECT

Respect: In this classroom (physical or virtual), everyone should feel welcome to share their thoughts in a respectful way. Remember the Golden Rule and treat your classmates and instructors the way you would like to be treated.

UF Statement on Accommodating Students with Disabilities: Students with disabilities who experience learning barriers and would like to request academic accommodation should connect with the Disability Resource Center. See the webpage Get Started With the DRC. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

COURSE SCHEDULE

Modules *open at 12:01 am and prior modules close* at *11:59 pm (EST) on Tuesday* of each week. Each module has a week's worth of work - trying to complete everything in a module the day it is due is not a good plan. It is best to develop a personal routine to make sure everything in the module is completed by the deadline, and you have time to ask for help if you need it.

8/21 – 8/26 **short week*	Introduction - course opens • Syllabus quiz (extra credit) • Discussion 0 (2 pts): Introductions
8/26 – 9/02	Module 1 Precipitation and Recharge: Why isn't rainfall enough? examines why we can't rely on rainfall alone for our water needs. Examine an example of a multi-national surface water conflict. • Assignment 1 (15 pts): Why isn't rainfall enough? (SLO 2) • Quiz 1 Precipitation and Recharge (SLO 2)
9/02 – 9/09	Module 2 Streams and Floods covers how stream flow is measured, what factors affect the stream discharge, floods, and dams. • Discussion 1.1 (10 pts): Water Sharing via the Atmosphere (SLO 4,5) • Assignment 2 (15 pts): Dams and Water Sharing [SLO 2,4,5] • Quiz 2: Streams and Floods (SLO 2,4)
9/09 – 9/16	Module 3 Water Underground introduces how water is stored and flows underground and the relationship between geologic materials and water flow and storage. • Discussion 1.2 (10 pts): Water Sharing via the Atmosphere [SLO 4,5] • Assignment 3 (15 pts): Hydrologic Cross Sections [SLO 1, 2,3,6] • Quiz 3 (10 pts): Water Underground [SLO 1,2,3]
9/16 – 9/23	Module 4 Mapping Groundwater Flow covers how wells are installed and how water levels in wells can be used to understand groundwater flow directions. • Discussion 2.1 (10 pts) The Nubian Aquifer – Disappearing Oasis [SLO 1,2,3,4,5]

	• Assignment 4 (15 pts): Exploring Flow with Aquifer Models [SLO 1,2,3,6] • Quiz 4 (10 pts): Mapping Groundwater Flow [SLO 1,2,3]
9/23 – 09/30	Module 5 Surface Water and Groundwater examines the complex interaction between groundwater and surface water. • Discussion 2.2 (10 pts) The Nubian Aquifer – Disappearing Oasis [SLO 1,2,3,4,5] • Assignment 5 (15 pts): The Suwannee River • Quiz 5 (10 pts): Surface Water and Groundwater
09/30 – 10/07	**Exam 1** (40 pts) [SLO 1,2,3,4]
10/07 - 10/14	**Synthesis 1** (20 pts) [SLO 1,2,3,4,5,6]
10/14 – 10/21	Module 6 Darcy's Law: How Slow Does Groundwater Flow? covers how groundwater flow rates are estimated with Darcy's Law and how groundwater can be "dated" using isotopes. • Discussion 3.1 (10 pts): Old Water, New Techniques [SLO 1,4,5,6] • Assignment 6 (15 pts): Darcy's Law [SLO 1,3] • Quiz 6 (10 pts): Darcy's Law [SLO 1,2]
10/21 – 10/28	Module 7 Pumping and Groundwater Budgets examines how an aquifer's inflows and outflows are impacted by pumping and the impacts of pumping on the land surface. • Discussion 3.2 (10 pts): Old Water, New Techniques [SLO 1,2,4,5,6] • Assignment 7 (15 pts): Groundwater Budgets [SLO 3,4,5,6] • Quiz 7 (10 pts): Pumping and Groundwater Budgets [SLO 3,4,5,6]
10/28 – 11/04	Module 8 Water Management uses U.S. law to introduce differing strategies for water allocation and consider the problems of sharing water between states and nations. • Assignment 8 (15 pts): Propose Your Presentation Topic SLO 6] • Quiz 8 (10 pts): Water Management [SLO 4,5]
11/04 – 11/11	Module 9 Water Chemistry and Karst describes the reactions that affect the chemistry of surface water and groundwater and examines karst and sinkholes. • Assignment 9 (20 pts): Post Your Presentation [SLO 1,2,3,4,5,6] • Quiz 9 (10 pts): Water Chemistry [SLO 2,6]
11/11 – 11/18	Module 10 Water Quality focuses on nutrients, natural contaminants, and saltwater intrusion. • Assignment 10 (9 pts): Peer Reviews of Presentations [SLO 6] • Quiz 10 (10 pts) Water Quality [SLO 2,3,6]
11/18 - 12/02*	*This "week" starts before and ends after Fall Break. Work on your assignments before or after the break. • Final presentation revisions (6 pts)
12/02 – 12/09	**Finals Week:** • **Synthesis 2** (20 pts) [SLO 1,2,3,4,5,6] • **Exam 2** (40 pts) [SLO 1,2,3,4]

NEED HELP?

Help with course material: GLY 3882C is a 3000-level class, which means it is aimed at junior-level students or above. You may be challenged by some parts of the material, so be sure to ask questions as you work through the assignments and as you prepare for the quizzes and syntheses. Post general questions on the class discussion board so we can answer them for everyone. The discussion board is often a quick way to get an answer, as your fellow class members can also contribute answers. You can also contact the teaching assistant or the professor for help when you need it.

Office hours are hosted on Zoom with live captioning available. Please let the us know if you have other access needs. Office hours are for your benefit - ask questions, get assignment help, discuss class topics or geoscience degrees and careers, or just say hello. If you can't make it to scheduled office hours, you can arrange an appointment for another time. *The TA handles Assignment grading, so they are the best point of contact for Assignment help*.

Technical Support: For issues with technical difficulties for E-learning, please contact the UF Help Desk: http://helpdesk.ufl.edu or (352) 392-4357. If you miss a deadline due to technical issues, requests for extensions or make-up activities should be accompanied by the ticket number from The Help Desk. The ticket number will document the time and date of the problem. Please let us know asap if you have technical problems when submitting assignments.

Mental Health and well-being: Sometimes being a college student can take a toll on your mental health. If you are mentally or emotionally struggling for any reason, you can contact the Counseling and Wellness Center. They have one-click access to people who can help you connect to the right resources for your situation. If these struggles are negatively impacting your performance your courses, I encourage you to contact the Dean of Students Care Area to connect with a support team that can help with temporary accommodations, authorization to make up missing course work, etc. Additionally, if you are comfortable doing so, please reach out to me and I will provide any accommodations in this course that I can.

Food Pantry: The Field and Fork Pantry is a resource on the University of Florida campus committed to supporting anyone in the UF community experiencing food insecurity. https://pantry.fieldandfork.ufl.edu/

Financial Assistance: UF's Aid-A-Gator program has small grants available to help students with unexpected financial needs.

Other Resources: Didn't see the kind or help you were looking for listed here? Links to a variety of support resources for online students are consolidated on this page: http://www.distance.ufl.edu/getting-help

STUDENT FEEDBACK & COURSE EVALUATION

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

UF POLICIES

University Policy on Academic Misconduct: Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Conduct Code: https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/, which includes the Honor Pledge.

UF Undergraduate Student Handbook: The student handbook has all the details on UF policies for students. https://dso.ufl.edu/resources/student-handbook/

That was a lot of info - thanks for reading all the way to the end!