

Spring 2015 GLY 3882C – Hydrology and Human Affairs

Dr. Liz Sreaton, sreaton@ufl.edu Office hours 10 am to 11 am Monday and 2 to 3 pm Weds, or by appointment

TA and office hours: Lanie Meridth, lmeridth@ufl.edu Office hours 5 to 6 pm Tues and Thurs

Overall Course Goals and Outcomes: Water is a resource that is vital for life, but the quality and quantity of our water resources are currently under threat. Students will understand the basic concepts of groundwater flow, and its relationship to surface water, humans, and the environment and apply concepts to current water-related issues. By the end of this course, students will 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 online on Canvas and consists of 11 modules.

As part of each module:

- There will be a background reading to introduce the concepts and terms and generally one to two <10 min long “lecture” videos.
- The reading will be followed by an online quiz, which consists of 10 T/F questions. Quizzes are open book and open notes and you can seek help from classmates.
- Assignments will involve working on maps or cross-sections, data interpretation and calculations, and virtual experiments. Assignments will include multiple-choice questions, essay questions, and evaluation of submitted maps, calculations, and cross sections. Two of the assignments will include preparing audio/video presentation.
- Each module will have two types of assignments.
 - 1) The first assignment in each module will provide practice with new concepts and skills. This assignment is the equivalent of answering questions and working on assignments “in class”. These assignments will have either multiple choice questions or submitted answers that you will assess using model answers. Self assessed questions will be given full points for completion. We will check on these self-assessments and deduct points for work that is incomplete or substantially identical to other students.
 - 2) The second assignment in each module will ask you to apply the concepts and your skills. The assignment will generally consist of problems and short essay answers that will be graded by the TA or professor.
- Assignments are open book and open notes and you can seek help from others, **but answers must be written in your own words and figures must be drawn by you.**
- In each module, the group discussion will further apply concepts and examine issues. The discussions will include student written posts and replies. The written post or presentation will be evaluated on how well it addresses the question or assignment and the quality of written or oral

communication. Discussion replies and peer reviews will be assessed on content, thoughtfulness, and quality of written communication.

- **Two 1-2 page writing assignments** will synthesize class material, discussions and/or presentations.
- **Two exams (one before spring break and one at the end of the semester)**, will consist of 9 questions at 10 points each. You will have 120 minutes for completion. In these wrap-up exams, you will apply what you have learned and integrate material from different modules. The wrap-up questions are open book and open notes but **are to be completed on your own**. During the semester, the class modules build on previous learning. As a result, material from earlier modules will be included on the final assessment, although the emphasis will be on Modules 6-11.

Grading 880 total points.

- 20 pts: Introductory quiz and discussion
- 100 pts: Best 10 of 11 quizzes @ 10 points.
- 450 pts: Assignments (best 10 of 11 for each):
 - "A" assignment (introduction and practice): 10 @ 25 points
 - "B" assignment (application): 10@20 pts
- 70 pts: Best 10 of 11 Discussion Posts @ 7 pts
- 60 pts: 2 Written 1-2 page Syntheses @30 pts
- 180 pts: 2 Exams @ 90 pts/each

A: ≥93.4%; A- 90.0-93.3%; B+ 86.7 – 89.9%, B: 83.4 – 86.6 %, B-: 80.0 – 83.3 %, C+ 76.7 – 79.9 %; C: 73.4 – 76.6%, C-: 70.0 – 73.3%, D+: 66.7 – 69.9%, D: 63.4 – 66.6%,. D- 60.0 – 63.3%; E 59.9% and below. (Information on how UF calculates GPA based on letter grades can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>)

These grade criteria are firm. Approximately 20-25 extra credit points will be available to all students during at various times during the semester. These will be in the form of extra questions on assignments or quizzes or extra discussions. Please take advantage of these opportunities for extra points. **We cannot negotiate extra points or consideration at grade assignment time.**

- **Academic Honor Code:** Students must follow the University of Florida Honor Code. On all work submitted for credit by students of 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.*" Before submitting any work for this class, please read the policies about academic honesty at <http://www.dso.ufl.edu/sccr/honorcode.php>.
- Turnitin is an online service to help prevent and identify student plagiarism. The wrap-up exams and the synthesis assignments will be evaluated using Turnitin to determine the originality of your work.

Textbook: Due to the lack of an appropriate textbook, chapters have been written for each module. These readings are found linked from each module.

Prerequisites: one chemistry course (e.g. CHM 1030).

Getting answers to your questions: This class is a 3000 level, which means it is aimed at junior-level students (although open to others). This means that you should be challenged by some parts of the

material. **Expect to have questions** as you read the course notes, work through the assignments, and prepare for the wrap-up questions. Questions are part of the learning process! Therefore it is very important to complete assignments well before the deadline. This will also help to minimize negative effects of any internet or computer problems.

- For problems with Canvas: call 352-392-4357 or via e-mail at helpdesk@ufl.edu.
- To report course-specific errors (a broken link in an assignment, a suspected error in quiz grading, missing information in a quiz question) email both the TA (lmeridth@ufl.edu) and me (screaton@ufl.edu). We are happy to correct any problems and will credit you 1 point **but the problems must be reported to us at least 2 hours before any deadline.**
- For content questions, the first place to go is to Discussions and the Q&A for the module. If the question hasn't been asked yet, you can post your question to the class. Help your classmates by answering questions --- BUT **help by explaining rather than just giving the answer!** Answers will be reviewed by the TA/professor daily M-F and additional information may be added.
- An email to the TA and prof is the best way to ask questions that are specific to you, such as about your grade or an upcoming conflict with a deadline.

Course announcements and email: When you log in to Canvas, please ensure that your Notification Preferences are set to "ASAP" for Announcements and for Conversation Messages. These tools will be used to inform you of any updates or changes in the course or to contact you.

Deadlines are shown below and are firm. Questions must be asked or problems reported at least 2 hours prior to any deadline. Your lowest score for each quiz, assignment, and discussion will be dropped. There is no dropping the introductory quiz, wrap-up questions, presentations, and syntheses assignments. **You are responsible for keeping track of deadlines. Please do not wait until the last minute for any deadline. Technical issues can occur and links can go bad.**

- Assignments and activities will generally open 2 weeks prior to the deadline. I strongly recommend starting quizzes and assignments early enough to ask questions and get answers.
- The two wrap-up assessments will become available four days prior to the deadline.

Attendance and conflicts: Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Because quizzes and assignments are available for 1-2 weeks and wrap-up questions are available for four days, only very major conflicts will be considered to allow deadline extensions or make-ups. For *pre-existing conflicts* (e.g., athletic, religious, academic), **you are responsible** for providing me with email or written notification and making arrangements with me (screaton@ufl.edu) for an alternate date as soon as you are aware of the conflict, **but no later than 1 week before a deadline.**

For *sudden, unexpected major issues that cause you to need additional time* **you are responsible** for providing me (screaton@ufl.edu) with written notification and making arrangements. Documentation will be requested. **Issues that arise within the last two hours before a deadline are not considered valid**

reasons for missing a deadline. You should plan your time to complete assignments well prior to the deadline.

Accommodations for Disabilities: Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluations: Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <http://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>

Course Modules and Deadlines

Introduction covers the syllabus and introduces basic actions that will be used in the course. *Late submissions will be accepted from those who added the course late, but this must be completed by Jan 16.*

- Jan 9: Introductory Quiz
- Jan 13: Introductions Discussion Post

Module 1 Fundamentals of Groundwater introduces the hydrologic cycle, how water is stored and flows underground, and the relationship between geologic materials and water flow and storage. Skills include calculations of groundwater depletion and the creation and interpretation of cross sections.

- Jan 16: Quiz 1, Assignment 1A, Initial Discussion 1 Post
- Jan 20: Assignment 1B and Discussion 1 reply

Module 2 Wells and Potentiometric Surface Maps covers how groundwater wells are installed and how water levels from wells can be contoured and interpreted to understand groundwater flow directions.

- Jan 23: Quiz 2, Assignment 2A, Initial Discussion 2 Post
- Jan 27: Assignment 2B and Discussion 2 reply

Module 3 Groundwater Inflow and Outflow examines how precipitation, evapotranspiration, and groundwater recharge and discharge are quantified and how potentiometric surface maps are used to understand the relationship between surface water and groundwater.

- Jan 30: Quiz 3, Assignment 3A, Initial Discussion 3 Post
- Feb 3: Assignment 3B and Discussion 3 reply

Module 4: Streams and Floods covers how stream flow is measured and how stream flow and how groundwater flow are connected. Skills include interpreting hydrographs and flood frequency curves.

- Feb 6: Quiz 4, Assignment 4A, Initial Discussion 4 Post
- Feb 10: Assignment 4B and Discussion 4 reply

Module 5 Florida Hydrogeology and Geology of Groundwater examines how geology influences groundwater flow and provides more detail on Florida's hydrogeology.

- Feb 13: Quiz 5, Assignment 5A (including aquifer examples presentation), Initial Discussion 5 Post

- Feb 17: Assignment 5B, Discussion 5 reply

Module 1 to 5 Wrap-Up

- Feb 20: 1-2 page synthesis assignment
- Feb 24: Exam

Module 6 Darcy's Law covers how hydraulic gradient and hydraulic conductivity control groundwater flow rates.

- Mar 10: Quiz 6, Assignment 6A, Initial Post Discussion 6
- Mar 13: Assignment 6B, Discussion 6 reply

Module 7 Pumping and Groundwater Budgets covers how an aquifer's inflows and outflows are impacted by the addition of pumping and under what circumstances pumping can lead to subsidence of the land surface.

- Mar 17: Quiz 7, Assignment 7A, Initial Post Discussion 7
- Mar 20: Assignment 7B, Discussion 7 reply

Module 8 Water Management introduces the basics of surface and groundwater law in the U.S. and summarizes strategies for management of water resources.

- Mar 24: Quiz 8, Assignment 8A, Initial Post Discussion 8
- Mar 27: Assignment 8B, Discussion 8 reply

Module 9 Water Chemistry describes the basics of the reactions that affect the chemistry of surface and ground water and examines karst and sinkholes.

- Mar 31: Quiz 9, Assignment 9A (including initial submission of presentation), Initial Post Discussion 9
- Apr 3: Assignment 9B, Discussion 9 reply

Module 10 Water Quality further examines water quality, focusing on nutrients and eutrophication and saltwater intrusion.

- Apr 7: Quiz 10, Assignment 10A, Initial Discussion Post 10
- Apr 10: Assignment 10B, Discussion 10 reply

Module 11 Water Contamination describes sources of water contamination, how contaminants migrate in groundwater, and basics of contamination remediation.

- Apr 14: Quiz 11, Assignment 11A, Initial Discussion Post 11
- Apr 17: Assignment 11B (Revised Presentation), Discussion 11 reply

Module 6 to 11 Wrap up

- Apr 21: 1-2 page synthesis assignment
- Apr 28: Exam