

Introduction to Water in the Environment

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Course meeting time & location: Spring Semester

- Monday & Wednesday at 10:40 to 11:30 am (CSE E119).
- Friday asynchronous activities
- Office hours are after class (MW 11:30-noon) or by appointment.

Teaching Format:

- Lectures, readings, class discussions, assignments, and quizzes.
- Canvas eLearning Login: <http://elearning.ufl.edu/>
- Contact instructor by office phone or through email (directly or through Canvas messaging system).

Pre-Requisites: none.

Required Textbook & Readings:

- Hornberger, G.M. and D. Perrone. 2019. Water Resources: Science and Society. Johns Hopkins University Press. 268 pages.
- Additional readings are provided in Canvas.

Welcome!

“Water not only floats a boat; it also sinks it” Chinese proverb. Water is essential to life. Yet, when water is in short supply or contains contaminants, we are faced with many challenges. This course is based on the concept that individuals making soil and water management decisions must possess important basic knowledge and skills. At the end of this course you will (1) explain how soil and water resources are interconnected and why this is the foundation to water management, and (2) plan the next step in your career development through the introduction of water disciplines and UF upper division water science courses.

During this course, the instructor will:

- Provide current, research findings on water & soil science topics
- Encourage a welcoming, community-based atmosphere (ask questions; share nature-science experiences)
- Introduce specialists working in the field of water science through guest lectures
- Introduce upper division UF courses that cover specific water science topics

UF Course Description

Introduce water quantity/quality concepts and their connection to soil and water management. Case studies are emphasized to reinforce concepts and connect research to solutions. Utilize online sources of water and soil data. Identify skillsets and subsequent UF coursework in water and/or soil science that complement your career goals.

Course Snapshot by Month

| Month | Module Topic | Assessment Type |
|----------|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| January | 1. Introduction 2. Water Resources | <ul style="list-style-type: none"> • Assignments 1-3 • Quiz 1 |
| February | 3. Water Use | <ul style="list-style-type: none"> • Assignments 4-6 • Quiz 2 & Midterm |
| March | 4. Water Quality Parameters for Water Management | <ul style="list-style-type: none"> • Assignments 7-8 • Quiz 3 |
| April | 5. Factors that Impact Water Quality: Soil, Land Use, Policy & Time | <ul style="list-style-type: none"> • Assignments 9-10 • Quiz 4 & Final |

Grading Structure & Scale

| Assessment Type | Point Value | Final Grade |
|-----------------------------------|-------------|-------------|
| Assignments 1-10 (15-20 pts each) | 160 | 32% |
| Midterm & Final (70 pts each) | 140 | 28% |
| Quiz 1-4 (25 pts each) | 100 | 20% |
| Lecture Questions | 75 | 15% |
| Syllabus & knowledge assessments | 25 | 5% |
| Total | 500 | 100% |

| Scale | | | |
|-------|--------------|---|--------------|
| A | 90.0 – 100% | B | 80.0 – 86.9% |
| B+ | 87.0 – 89.9% | C | 70.0 – 76.9% |
| C+ | 77.0 – 79.9% | D | 60.0 – 66.9% |
| D+ | 67.0 – 69.9% | E | < 60% |

- ✓ Rubrics will be provided in Canvas with graded activities.
- ✓ Current UF grading policy for assigning grade point averages can be found here: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

Assessment Grading Overview

1. Ten (10) assignments involve finding and interpreting information from online resources. Assignments are turned into Canvas. Late homework assignments are subject to a 1 point penalty per day the homework is past the due date.
2. Four (4) Quizzes that prepare you for the midterm and final. The quizzes are open book, timed and offered in Canvas to be taken outside of scheduled lecture times. A quiz can be taken up to two times over a three-day period. Each quiz will consist of multiple choice and fill in the blank questions.
3. Midterm and Final exams are closed book and offered during scheduled class times. Both include multiple choice, fill in the blank, and short answer questions. Questions from the quizzes are also included. The final is cumulative, with an emphasis on material presented since the midterm.
4. Lecture Questions will be provided prior to the commencement of each lecture (Week 2-15). These questions are answered during lecture and turned in at the end of the class period. Attendance is required for days when guest lectures are scheduled (see topic schedule). Students may miss six lecture question assignments without penalty.
5. Syllabus and Knowledge Assessments are closed book assessments in Canvas. Their main purpose is to guide communication between student and instructor at the beginning and the middle of the semester.

Attendance and Late Policy

Late submission of assignments and assessments can be approved by instructor in advance and may be subject to a grade penalty. Requirements for class attendance and make-up quizzes, exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Online Course Evaluation Process

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. 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/>

Course Outline

Assignments & Quizzes are turned-in to Canvas by Friday 5 pm. Chapter readings are from required textbook. Additional required readings are provided through Canvas.

| Topics by Week | | Weekly To-Do |
|------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Introduction | 1 Week of Jan 11 Hydrological Cycle | i. Introduction; Visualizing the water cycle ii. Soil & the hydrological cycle iii. Water fluxes and sea level change Prior Knowledge Assessment 1 |
| | 2 Week of Jan 18 Surface Water Resources | i. Monday (no class, Holiday) ii. Ice & Snow iii. Lotic & Lentic Systems: rivers to watersheds and lake trophic state Assignment 1 |
| Water Resources | 3 Week of Jan 25 Surface Water Resources Groundwater Resources | i. Salinity ii. Groundwater as a source of water to ecosystems iii. Ecological vs jurisdictional waters: ephemeral/intermittent/perennial streams & the Clean Water Act Assignment 2 |
| | 4 Week of Feb 1 Groundwater Resources Soil Water Resources | i. Soil & soil quality ii. Water, soil formation & ecosystem services iii. Saline soils and saline groundwater Quiz 1 Assignment 3 |
| | 5 Week of Feb 8 Soil Water Resources | i. Soil properties, plant available water & drought prediction ii. Soil, infiltration & stream flow: stormwater case study iii. When soil water is frozen: permafrost case studies Assignment 4 |
| Water Use | 6 Week of Feb 15 Water Use | i. Water use & water consumption, ii. Factors impacting water use iii. Groundwater depletion Assignment 5 |
| | 7 Week of Feb 22 Environmental Water Use | i. Minimum Flows & Levels (guest lecture) ii. Solutions, Part 1 iii. Solutions, Part 2 Quiz 2 Assignment 6 |
| | 8 Week of Mar 1 Environmental Water Use | i. Solutions: Case studies ii. Wrap-up & Review iii. Midterm Midterm Friday (Week 1-8) |

| Topics by Week | | Weekly To-Do |
|--------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Water Quality | 9 Week of Mar 8 Introduction to Water Quality | i. Water quality & reference state ii. Dissolved oxygen & temperature iii. Alkalinity & pH, part 1 iv. Alkalinity & pH, part 2 Read Chapter 12 Read UF Lakewatch “A beginners guide to water management –the ABCs” Prior Knowledge Assessment 2 |
| | 10 Week of Mar 15 Freshwater topics | i. Limiting factors to primary productivity ii. Allothoconous and autothconthous sources of energy/carbon iii. Biological oxygen demand Fondriest Environmental Learning Center website readings: environmental monitoring Assignment 7 |
| | 11 Week of Mar 22 Eutrophication | i. Eutrophication: causes & impacts ii. Limiting nutrients to primary productivity in lakes iii. Catch-up day Watch the recorded seminar, Dr. Hans Paerl Quiz 3 Assignment 8 |
| | 12 Week of Mar 29 Impaired surface waters | i. US EPA sources & causes of water quality impairment ii. UF CAIP Intro to Invasive Aquatic Plants (guest lecture) iii. Emerging contaminants: microplastics (guest lecture) No readings or videos |
| | 13 Week of Apr 5 Soil, land use & water | i. Soil properties, soil quality & water quality ii. Land use & water quality iii. Soil, best management practices, & water quality: case studies TED Talk: Water 4.0 |
| Drivers of Change | 14 Week of Apr 12 Water quality over time | i. Impact of The Clean Water Act ii. Impact of land use change on water quality/quantity case studies iii. Eutrophication case study Watch a recorded seminar: Dr. Peter Groffman Quiz 4 Assignment 9 & 10 |
| | 15 Week of Apr 19 Rotating topics on Best Management Practices / guest lectures | i. UF/IFAS Connecting water quality to water use in the urban landscape (guest lecture) ii. Review & wrap-up No Readings |
| | 16 Finals Week | Final Exam Date & Time TBD |

Disclaimer: As we go through the semester, specific topics and activities on the syllabus may change. Such changes will be communicated clearly and in advance.

Course Learning Objectives

After successfully completing the course, students will be able to:

| | |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Content | <ol style="list-style-type: none"> 1. <i>Define</i> key terminology in water resources and <i>discuss</i> variations in definitions of the same term 2. <i>Illustrate</i> the role of soil in the hydrologic cycle 3. <i>Relate</i> soil properties and land use/land cover to water availability on a local to watershed scale 4. <i>Specify</i> the key water parameters used to measure water quality and <i>explain</i> their importance to water management 5. <i>Identify</i> processes that occur in soil that influence the delivery of high-quality water to streams |
| Critical Thinking | <ol style="list-style-type: none"> 6. <i>Evaluate</i> water use in relation to human needs and natural ecosystem function 7. <i>Differentiate</i> the natural and anthropogenic factors that impact the water quality of surface water bodies, with an emphasis on non-point sources of nutrients 8. <i>Propose</i> a new focus area in water resource solutions according to the land-grant university mission and the current efforts of UF/IFAS Extension 9. <i>Design</i> a personalized curriculum plan using upper-division UF water science courses for a specific discipline and/or career objective |
| Communication | <ol style="list-style-type: none"> 10. <i>Interpret</i> and <i>analyze</i> written text, graphs, data tables, oral messages and multimedia presentations used in water resources 11. <i>Reflect</i> on course materials and pre- and post-assessments through writing short essays |

Course Learning Objectives & Assessments

| Exams/Quizzes | | SLO (#) by Topic Category | | | | | | | | | | |
|---------------|---------|---------------------------|---|---|---|---------------|---|---|----------------------------|---|----|----|
| | | Water Use & Resources | | | | Water Quality | | | Water Science Applications | | | |
| | | 1 | 2 | 3 | 6 | 4 | 5 | 7 | 8 | 9 | 10 | 11 |
| 1 | Quiz | X | X | | | | | | | | | |
| 2 | Quiz | X | X | X | X | | | | | | | |
| 3 | Quiz | | | | | X | | X | | | | |
| 4 | Quiz | | | | | | X | X | | | | |
| | Midterm | X | X | X | X | | | | | | | X |
| | Final | X | | | | X | X | X | X | | | X |

| Assignments | SLO (#) by Topic Category | | | | | | | | | | |
|-------------|-----------------------------------------------------------------------------------------------------------------|---|---|---|---------------|---|---|----------------------------|---|----|----|
| | Water Use & Resources | | | | Water Quality | | | Water Science Applications | | | |
| | 1 | 2 | 3 | 6 | 4 | 5 | 7 | 8 | 9 | 10 | 11 |
| 1 | NSIDC & NASA websites: short answer questions & data/graph interpretations | | | | | | | | | | |
| 2 | UF/IFAS EDIS water publications, part 1: outline | | | | | | | X X | | | |
| 3 | USGS online tools: locate your watershed & create a groundwater map or graph | | | | | | | X | | | |
| 4 | NOAA drought monitoring website & USDA NRCS Web Soil Survey: short answer questions & data/graph interpretation | | | | | | | X | | | |
| 5 | GapMinder.org: create graphs using UN data | | | | X | | | X | | | |
| 6 | Reflection assignment & post knowledge assessment | | | | | | | X X | | | |
| 7 | USGS & St John's River Water Management District online water quality tools: create maps & data figures | | | | X | | | X | | | |
| 8 | UF IFAS Lakewatch online data: short answer questions & data/graph interpretation | | | | X X | | | X | | | |
| 9 | UF/IFAS EDIS water, part 2: update outline & propose a new EDIS publication | | | | | | | X X | | | |
| 10 | Reflection assignment & post knowledge assessment | | | | | | | X X | | | |

COVID Response

We will have face-to-face instructional sessions to accomplish the student learning objectives of this course. In response to COVID-19, the following policies and requirements are in place to maintain your learning environment and to enhance the safety of our in-classroom interactions.

- You are always required to wear approved face coverings during class and within buildings. Following and enforcing these policies and requirements are all our responsibility. Failure to do so will lead to a report to the Office of Student Conduct and Conflict Resolution.
- This course has been assigned a physical classroom with enough capacity to maintain physical distancing (6 feet between individuals) requirements. Please utilize designated seats and maintain appropriate spacing between students. Please do not move desks or stations.
- Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class.
- Follow your instructor's guidance on how to enter and exit the classroom. Practice physical distancing to the extent possible when entering and exiting the classroom.
- If you are experiencing COVID-19 symptoms, please use the UF Health screening system and follow the instructions on whether you can attend class.

- Symptoms of Coronavirus: <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>
- UF Health guidance on what to do if you have been exposed to or are experiencing Covid-19 symptoms: <https://coronavirus.ufhealth.org/screen-test-protect-2/frequently-asked-questions/covid-19-exposure-and-symptoms-who-do-i-call-if/>
- Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work.
 - Find more information in the university attendance policies: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

UF Resources & Support

1.Services for Students with Disabilities: The Disability Resource Center (DRC) coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

Students need a current accommodation letter each semester in order to receive academic accommodations. During the initial appointment, a Learning Specialist at the UF Disability Resource Center (DRC) will show students how to request their letter. After the first semester with the DRC, students are responsible for requesting their current accommodation letter by submitting an Accommodation Letter. In order to receive academic accommodations, students are responsible for submitting a current accommodation letter to the professor in each course. This should be an interactive conversation between the student and the instructor about the course requirements and the specific accommodations that the student anticipates utilizing in that course. Students must provide ample notification of requested accommodations to their professors. Reasonable accommodations cannot fundamentally alter essential course or degree requirements.

Refer to the DRC website and the UF Policy section for the steps necessary to request classroom accommodations.

- Disability Resource Center, 0001 Reid Hall, 352-392-8565, <https://disability.ufl.edu/>

2.Getting Help, Technical difficulties: For issues with technical difficulties for Canvas, please contact the UF Help Desk.

- E-learning technical support, the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu. Walk-in: HUB 132

3. Getting Help, Academic Resources:

- Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services career.ufl.edu/.
- Library Support: cms.uflib.ufl.edu/ask various ways to receive assistance with respect to using the libraries or finding resources.
- Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420.
- General study skills and tutoring. teachingcenter.ufl.edu/
- Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers. writing.ufl.edu/writing-studio/
- Student Complaints On-Campus: sccr.dso.ufl.edu/policies/student-honor-codestudent-conduct-code/
- Student Success Initiative, <http://studentsuccess.ufl.edu>.

4. Getting Help, Personal Resources: Students experiencing crises or personal problems that interfere with their general wellbeing are encouraged to utilize the university's health and wellness resources.

- U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit umatter.ufl.edu/ to refer or report a concern and a team member will reach out to the student in distress.
- Counseling and Wellness Center: Visit counseling.ufl.edu/ or call 352-392-1575 for information on crisis services as well as non-crisis services.
 - Counseling Services
 - Groups and Workshops
 - Outreach and Consultation
 - Self-Help Library
 - Wellness Coaching
- Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit shcc.ufl.edu/.
- University Police Department: Visit police.ufl.edu/ or call 352-392-1111 (or 9-1-1 for emergencies).
- UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; ufhealth.org/emergency-room-trauma-center.

UF Policies

1. Academic Honesty: As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity." You are expected to exhibit behavior consistent with this commitment to the UF academic community,

and on all work submitted for credit 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."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

2. Class Demeanor or Netiquette: All members of the class are expected to follow rules of common courtesy in all email messages, discussions and chats.

3. Software Use: All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

4. Accommodating students' religious observances: Students and faculty must work together to allow students the opportunity to observe the holy days of his or her faith. A student needs to inform the faculty member of the religious observances of his or her faith that will conflict with class attendance, with tests or examinations, or with other class activities prior to the class or occurrence of that test or activity. The faculty member is then obligated to accommodate that particular student's religious observances. Because our students represent a myriad of cultures and many faiths, the University of Florida is not able to assure that scheduled academic activities do not conflict with the holy days of all religious groups. We, therefore, rely on individual students to make their need for an excused absence known in advance of the scheduled activities.