

ENV 6508 – Fall 2018

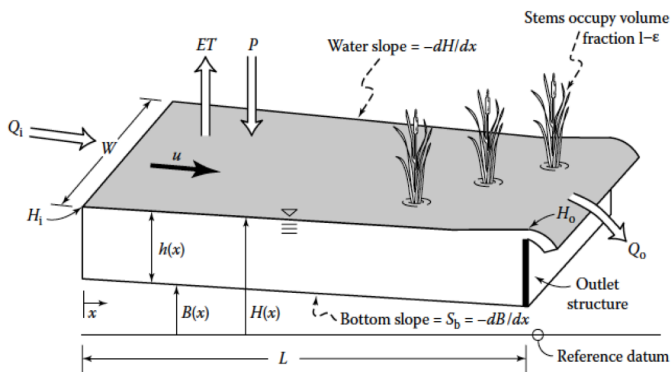
**Instructor:** Dr. David Kaplan, Environmental Engineering Sciences  
[dkaplan@ufl.edu](mailto:dkaplan@ufl.edu)  
[www.watershedecology.org](http://www.watershedecology.org)

**Contact:** Class website (UF e-Learning): <https://lss.at.ufl.edu>  
Course e-mail: use e-Learning for correspondence  
Office Hours: immediately after class and by appointment (102 Phelps Lab)

**Pre-requisites:** A previous course in wetland ecology is suggested, but relevant background material will be made available for students without this experience. Students should be comfortable using MS Excel.

**Time and Location:** Tuesday – Period 7 (1:55 - 2:45 PM); Thursday – Periods 7-8 (1:55 - 3:50 PM). Also offered as a Distance Education (online) section.

**Reading Material:** No required text. Readings will come from the scientific literature, case studies, and agency reports. Relevant readings on each topic area will be assigned weekly.



**Course Description:** This course will introduce students to the physical and biological processes affecting the storage and flow of water, solutes, and sediments in wetland ecosystems. Students will **first** learn to apply the basic principles of surface water and groundwater hydrology specific to wetland systems, including the development of wetland water balance models. **Next**, students will learn theoretical and applied approaches for describing wetland hydraulics and hydrodynamics and how this affects solute and particulate transport. **Finally**, the course will cover the physical and biological processes controlling chemical transport in wetlands, and students will develop multiple solute transport models for natural and constructed wetland applications. Throughout the course, the course will focus on the physical, biological, and ecological processes that affect (and are affected) by wetland hydrology.

**Who Should Take this Course?** Anyone interested in the theory and practice of wetland hydrology, ecology, restoration, and management, including those who study and/or practice environmental or water resources engineering, ecology, environmental science, natural resource management, and environmental policy or law.

**Course Topics and Schedule:** This schedule is tentative and subject to change based on the timing of fieldtrips, guest lecturer schedules, student interests, and current events.

Week	Tuesday Lecture (1 period)	Thursday Lecture (2 periods)	Readings*/Due Dates
8/19	No class	Course Introduction: Wetland definitions and the role of water in wetland structure and function	---
8/26	Introduction to wetland water budgets and hydroperiod	Components of the water budget: inflows, outflows, and storage	Mitchell and Jawitz (2014)
9/2	Precipitation and runoff	Evapotranspiration; Surface water flows I: structures and channels	Kadlec (1990), He et al. (2010)
9/9	Groundwater-surface water exchange in wetlands	Surface water flows II and wetland hydrology case studies	Kirk et al. (2004), Kaplan et al. (2011)
9/16	Hydrology exam review	<b>Guest Lecture:</b> Dr. Chris Martinez, Flow and Mixing in Wetlands	<b>HW #1 DUE (TUES, 23:59)</b>
9/23	<b>Exam 1 – Hydrology (In-Class)</b>	Intro to hydraulics and mixing in wetlands; Turbulent vs. laminar flows	Guo and Zhang (2016)
9/30	Wetland water quality: nutrients, organic/inorganic contaminants, sediments and colloids	Wetland transport models I: Plug Flow, CSTRs and CSTRs in Series; Intro to Method of Moments	Kadlec (1994)
10/7	Transport models II: Advection-Dispersion Model	Transport models III: OTIS; More Method of Moments	Martinez & Wise (2003)
10/14	Moment analysis exercise; Release HW #2	<i>Bringing it all together:</i> wetland transport case studies	Harvey et al. (2005)
10/21	<b>Guest Lecture:</b> Dr. Peter Frederick, Wetland Water Management	Transport exam review; Introduction to wetland hydro-(bio)-geo-chemistry	Niedermeier and Robinson (2007)
10/28	<b>Exam 2 – Transport (In-Class OR any time through 11/5, 11:59 PM)</b>	Wetland hydrologic assessment: physical and biological processes	<b>HW #2 Due (TUES 23:59)</b> Jones et al. 2009
11/4	GIWs: a “significant nexus”?	Wetland hydrology at the landscape scale: GIWs and cumulative effects	McLaughlin et al. (2014); Hansen et al. (2018)
11/11	Anthropogenic and climate change impacts on wetland hydrology	Modeling wetland hydrology, hydraulics, and hydrodynamics I	McMeniman et al. (2008); Havril et al. (2018), Min et al. (2010)
11/18	Modeling wetland hydrology, hydraulics, and hydrodynamics II	<b>Thanksgiving – No Class</b>	<b>Synthesis Paper Due (TUES, 11:59 PM)</b>
11/25	Exam 3 Review	Introduction to wetland treatment systems design	Kadlec (2009) <b>WetlandHydroArt presentations (in-class)</b>
12/2	<b>Exam 3 – Everything Else (In-Class)</b>	<b>Reading Days - No Class</b>	<b>THERE IS NO FINAL</b>

**\*All readings should be completed BEFORE THE TUESDAY LECTURE, even though we may discuss some papers on Thursdays**

### **Course Expectations:**

- **Attend class and arrive on time.** Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.
- **Complete assigned readings** PRIOR to the class for which they are assigned.
- **Participate in class discussions**, including your thoughts on the assigned readings and lecture subjects. Learning is more than passive accumulation of information.

### **Grading Scheme and Assignments:**

Participation:	5%
Homework (2):	20% (10% each)
Exams (3):	60% (20% each)
Synthesis Paper:	15%
Extra Credit: <i>WetlandHydroArt</i>	5% (optional)

**Grading Scale:** A ( $\geq 93$ ), A- ( $\geq 90$  &  $< 93$ ), B+ ( $\geq 87$  &  $< 90$ ), B ( $\geq 83$  &  $< 87$ ), B- ( $\geq 80$  &  $< 83$ ), C+ ( $\geq 77$  &  $< 80$ ), C ( $\geq 73$  &  $< 77$ ), C- ( $\geq 70$  &  $< 73$ ), D+ ( $\geq 67$  &  $< 70$ ), D ( $\geq 63$  &  $< 67$ ), D- ( $\geq 60$  &  $< 63$ ), E ( $< 60$ ). GPA information can be found: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

**Attendance and Participation:** Attending class is required (for on-campus students), and your in-class participation is strongly encouraged; it will make class a lot more interesting. Note, you cannot receive an A in this course without actively participating.

- **On-campus students:** earn your participation grade by consistently attending class, asking and answering questions (*based on your reading of assignments ahead of time*), **participating in presentation of assigned papers**, and offering your opinion on course topics and current events.
- **EDGE Students:** earn your participation grade by posting (at least) five questions or comments about the current readings, lecture, or student presentations to the Discussion board. I will attempt to select one or more question to address each Tuesday during lecture.

**Homework:** Two homework projects (completed individually) will be assigned during the semester. The first will challenge students to develop a water budget for a specific wetland, and second will focus on solute transport in a constructed wetland. Students will have two weeks to work on each assignment. Additional details will be announced in class and listed in the assignment.

**Exams:** Three (non-cumulative, equal weight) exams will be given over the course of the semester. A formula sheet will be provided, and calculators are allowed. For on-campus students, exams will be held in class (see schedule). For online students, you may take the exam at any time/place you wish during the week of the exam, but you may only spend one hour on it. For all students, strict adherence to exam instructions is expected. Any deviations from the instructions will be construed as a willful breach of the student honor code and will be reported to the Dean of Students Office for consideration of disciplinary action.

**Synthesis Paper:** An original, well-researched, well-written and thorough research paper, ideally focused on a topic that bridges your own research and the central concepts of this course. Papers should be 6-10 pages long (single-spaced, excluding references). A brief (2-paragraph) summary of your chosen topic is due to the instructor by September 28<sup>th</sup>.

**Reading List:** All readings are available on the course website (and available online through the UF Library subscription).

**Field Trips:** Two or three field trips will be organized to visit local and regional wetlands. Participation is optional but strongly recommended to help you fully appreciate the material covered in this course. Trip locations and dates are TBD and will be finalized in the first few weeks of class.

**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/honorcodes/honorcode.php>.

**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.

**Campus Helping Resources:** Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance:

- *University Counseling & Wellness Center*, 3190 Radio Road, 352-392-1575, [www.counseling.ufl.edu/cwc/](http://www.counseling.ufl.edu/cwc/)
  - Counseling Services
  - Groups and Workshops
  - Outreach and Consultation
  - Self-Help Library
  - Training Programs
  - Community Provider Database
- *Career Resource Center*, First Floor, J. Wayne Reitz Union, 392-1601, [www.crc.ufl.edu](http://www.crc.ufl.edu)

**Students with Disabilities Act:** Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://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.

**Distance Students:** Each online distance learning program has a process for, and will make every attempt to resolve, student complaints within its academic and administrative departments at the program level. See <http://distance.ufl.edu/student-complaints> for more details.

**Evaluations:** Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://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/>.