SWS 4244
WETLANDS

FALL 2025

Instructor
Mark Clark
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352-294-3115
G175A McCarty Hall A

Office Hours
Tuesday, Thursday 10:30-12:00
or by appointment

PREREQUISITES: None

PHYSICAL CLASSROOM LOCATION: MCCD G001

SYNCHRONOUS MEETING TIMES: For on campus students and DE students that are interested: Lectures Tuesday 8:30-10:25am and Thursday 9:35-10:25 (classroom or virtual zoom). Chat Session –Wednesday evenings 7:00-8:00 pm

Zoom meeting link for lectures https://ufl.zoom.us/j/92244172376
Zoom meeting link for Wednesday chats. https://ufl.zoom.us/j/96673557945

COURSE WEBSITE: The course website can be accessed through E-Learning and Canvas: http://elearning.ufl.edu

COURSE DESCRIPTION AND STATEMENT OF GENERAL EDUCATION PURPOSE:
Wetland ecosystems play an integral role in the physical, chemical and biological processes that occur on earth. Plant and animal habitats found in wetlands are unique and play a critical part in the lifecycle of both commercially important species as well as many threatened and endangered organisms. Wetlands are also often a focal point of issues related to protection of environmental resources, environmental policy and property rights. This course introduces wetland ecosystems focusing first on the hydrologic drivers, biogeochemical processes, unique soil characteristics and the biological adaptations that allow organisms to survive in this environment. Next, the interaction of these processes to form unique types of wetland communities, how they change over time and the environmental factors that shape these communities are investigated. Lastly, the interaction of humans with wetlands is discussed including regulations used to protect wetlands and requirements for mitigating wetland loss as well as how wetlands are being integrated into the human landscape to help improve water quality and treat just about any type of stormwater or wastewater. The course will provide both the fundamental science behind our understanding of wetland processes and functions as well as a practical application of these concepts and how they influence all of us on a regular basis.

COURSE OBJECTIVES:
- To familiarize students with the structure and function of wetlands.
- To make students aware of the role wetlands play at the watershed scale and in regulating global cycles.

- To familiarize students with ecological processes in wetlands related to succession, habitat and change in response to environmental forcing parameters.
- To acquaint the student with policy and regulatory issues related to wetlands.
- To acquaint the student with concepts of wetlands mitigation, restoration, and integration of constructed wetlands to address water quality and quantity issues in urban and agricultural landscapes

STUDENT LEARNING OBJECTIVES:

- Understand the structure of wetlands including hydrology, biogeochemistry, soils and vegetation adaptations.
- Understand the function of wetlands and how they influence systems at the watershed and global scale.
- Comprehend the difference between wetland community types and what specific environmental forcing parameters influence those communities.
- Comprehend the wildlife found in wetlands and what influence they can have on creating and modifying wetlands.
- Evaluate federal and local policies intended to maintain and preserve wetland functions in the landscape.
- Understand the opportunities and techniques used to integrate constructed and treatment wetlands into human landscapes as a means to mitigate water quality impacts while synthesizing and applying all aspects of wetland structure and ecological processes learned during the course.

COURSE FORMAT: The course material is mainly conveyed through three 40-50-minute lectures per week. Prerecorded lectures are also made available asynchronously on the class website and released weekly. For on-campus registered students there are two required field trips that will occur during Tuesday class periods. For DE students, two equivalent "virtual tour" video recordings will made available.

There is also an optional chat session available Wednesday evening's from 7:00-8:00 hosted on Zoom. The chat session will be used to address questions students may have or to discuss current events pertinent to the subject matter being discussed.

TEXTBOOK: (optional, not required)
Wetlands. Mitsch and Gosselink. 3rd, 4th or 5th Editions. John Wiley & Sons, Inc.

GRADING: Overall grade will be determined based on a student's performance in all the following categories:

Quizzes	20 %
Homework	20 %
On-campus/Virtual Field Trips	10 %
Project	20 %
Exam 1 (Units 1-6)	15 %
Exam 2 (Units 7-11)	15 %

Quizzes - There will be an open notes quiz posted on Canvas almost every week covering lecture material from the previous week.

Homework - Homework grades will include three field assignments where students will be required to: 1) locate and document hydrologic indicators (7%), 2) determine the classification of a local wetland using the online National Wetlands Inventory (5%), 3)locate and document a list of wetland flora and fauna species found in wetlands (8%).
Field Trips – There will be two field trips (virtual or on-campus depending on DE or on-campus student). Participation in the trips will account for 10% of your final grade. Students will be responsible for attending or viewing virtual recordings and then responding to questions in writing about each trip to verify participation.
Project – The project will consist of summarizing one of the USFWS Wetland Community Profiles and creating a 10-15 slide PowerPoint presentation with recorded narrative. Students may work in pairs if desired. Students will also be responsible for reviewing and grading five other student's presentations. Presentation grades will be based 60% on student peer review and 40% on TA/instructor review.
Exams – Exam #1 will cover units 1-6 and Exam #2 will cover units 7-11. There will be no final exam.

Use of Generative AI
U-M GPT, ChatGPT, and other similar technologies are advancing rapidly and there are many instances where they will be key tools in your schoolwork and career. For the purposes of this class, I am asking all students *not* use these technologies. I believe this is key for this learning environment because I want you to learn how to *critically engage with* the material presented and how to synthesize the material on your own. Artificial Intelligence cannot do this learning for you. Students who are confirmed to have used GenerativeAI or the like to complete their assignments will receive a grade of zero for that assignment.

Final letter grade: The final letter grade for the course will be based on current UF policies that can be found at https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx. and are outline below.

Letter	Course Grade
A	94-100
A-	90-93.9
B+	87-89.9
B	84-86.9
B-	80-83.9
C+	77-79.9
C	74-76.9
C-	70-73.9
D+	67-69.9
D	64-66.9
D-	60-63.9
E	< 60.9

Late assignments: All assignments are due by midnight on the date requested on the Canvas Website. Assignments that are late will result in an initial 5% reduction in grade with an additional 5% deduction for every additional 2 days the assignment is late.

ONLINE COURSE EVALUATION PROCESS:
Student assessment of the instructor and the course will be available at the end of the semester. Students are expected to provide feedback on the quality of instruction in the

course using a standard set of university and college criteria. These evaluations are conducted online at https://evaluations.ufl.edu/evals/Default.aspx . Evaluations are typically open for students to complete during the last two or three weeks of the semester. You will be notified of the specific times when they are open

TENTATIVE COURSE SCHEDULE:

Course Overview and Expectations (Aug 21)

Unit 1 Introduction (Aug 26)

-Definition of wetland
- -Soil
- -Hydrology
- -Vegetation

-Functions/Importance
- -Water Quality
- -Water Supply
- -Habitat
- -Food Web Connections
- -Flood Control
- -Fisheries
- -Education
- -Recreation

-Where do we find wetlands in the landscape?

Unit 2: Hydrology (Aug 28, Sep 2)

-Hydrologic cycle and Wetland Water Budget

-Precipitation

Atmospheric moisture, Phase changes, Calculating aerial average precipitation.

-Evaporation and Transpiration

Pan evaporation, Energy budget method, Evapotranspiration, Interception Through fall

-Infiltration

Soil moisture, Infiltration methods

-Groundwater

General properties, Groundwater movement, Surface connectivity

-Water budget calculations

-Tides

-Rainfall runoff

Runoff processes: rational method, curve number approach, Hydrograph analysis, and Unit hydrograph theory

-Hydrologic indicators

Unit 3: Biogeochemistry (Sep 4, 9, 11, 16)

- Upland vs. Wetland Soil Characteristics
- Reduction/Oxidation
- Microbial activity

- Oxygen availability
- Carbon Cycling
- Nitrogen Cycling
- Phosphorus Cycling

Unit 4 Hydric Soils (Sept 18)
- Legal definition of Hydric soils
- Soil Orders/Morphology
- Hydric Soil Delineation
- Field Indicators

Field trip #1: Natural Area Teaching Laboratory (Sep 23)

Unit 5: Wetlands Vegetation (Sept 25, 30)
-Environmental Stressors
Inundation, anoxia, hypoxia, salts
-Biological Adaptations
Vascular Plants, Animals
-Vegetative Succession
Environmental forcing functions, Seed Banks, Landscape Patterns, Van der Valk's Environmental Sieve concept

Unit 6: Integrated Wetland Systems and Communities (Oct 2, 7, 11)
-Ecosystem-Level Processes
- Hydrarch succession
- Environmental feedback loops and forcing functions
Roll of fire
Change in elevation due to sediment accumulation
Raised bogs
-Upland Wetland interface
-Nutrient distribution related vegetative structure

Unit 7 Wetland Classification (Oct 14, 16)
-Types of Communities and Environmental Forcing Functions
-Northern and Sub-Tropical Peatlands
-Pocosins
-Forested Wetlands
-Riparian Wetlands
-Salt Marshes
-Mangrove Forests
-Classification

Exam #1 (Units 1-6) (available online Oct 17- Oct 20)

Unit 8: Wetland Wildlife (Oct 21, 23, 28)
-Major adaptations
-Animal Architects
Modifying and creating wetlands
-Common Wetland Threats Today
Direct and indirect impacts

-Duck Nesting and Ecology and Management

Unit 9: Anthropogenic Impacts on Wetlands (Oct 30, Nov 4)

-Hydrologic impacts
-Water quality impacts
-Exotic species impacts

Unit 10: Regulatory Issues and Policy (Nov 6, 11)

-Laws
    History, Dredge and fill, water quality, habitat protection
-Delineation
    History, agency jurisdiction, limits of protection
-Mitigation
    On site, mitigation banking, credits
-Water Quality
    Narrative and Numeric Nutrient Standards

Unit 11: Constructed and Treatment Wetlands - Concepts and Considerations (Nov 13, 18, 20)

-Definitions and Justification of Restoration and Construction
    Mitigation, Habitat enhancement, Water quality
-Types of Constructed systems
    Restoration, Wastewater, Stormwater, Agricultural runoff, Mine drainage
-Location in Landscape
-Design Hydrology
    Depth, Hydroperiod, Residence time, Drawdown cycle
-Basin Morphology
-Water Quality Inputs
    Type of compounds, Sediments, BOD, loading rates
-Design options
    Surface flow, gravel bed, submerged aquatic, floating aquatic, vertical flow, horizontal flow,
-Vegetation
    Types, Exotics, Self-organization, Planting techniques
-Management Issues
    Performance, Wildlife, Mosquitoes, Sediments
-Cost Justification

Exam #2: Units 7-11 (available online Nov 28- Dec 1)

Field trip #2: Stormwater Ecological Enhancement Project (Dec 2)

UNIVERSITY POLICIES:

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: **https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/**

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.

Services for Students with Disabilities:
The Disability Resource Center 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

0001 Reid Hall, 352-392-8565, **https://disability.ufl.edu/**

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, **https://counseling.ufl.edu/**
  Counseling Services, Groups and Workshops, Outreach and Consultation, Self-Help Library Wellness Coaching
- *Career Resource Center,* First Floor JWRU, 392-1601, **https://career.ufl.edu/**

If you have a complaint:
Should you have any complaints with your experience in this course please visit **https://distance.ufl.edu/student-complaint-process/** to submit a complaint.

Campus Resources:

Health and Wellness

U Matter, We Care:
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: https://counseling.ufl.edu and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

E-learning technical suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling; https://career.ufl.edu.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall*,* 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*:* https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/;https://care.dso.ufl.edu.

On-Line Students Complaints*:* http://www.distance.ufl.edu/student-complaint-process.