

420.628.51 ECOLOGY AND MANAGEMENT OF WETLANDS
Fall 2017: Course Information and Syllabus

Instructor:

Dr. Kevin D. Brittingham
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Office hours: By appointment

Meeting times:

Saturdays 10:00 AM – 12:45 PM, 9/9/2017 – 12/16/2017
Campus location: DC

Course information:

This course is part of Johns Hopkins Krieger School of Arts and Sciences (KSAS), Advanced Academic Programs (AAP) in the Environmental Sciences and Policy Program (ESP). Students will be introduced to the importance and function of wetlands in the Chesapeake Bay Region. The fourteen week course is evenly split among field and classroom sessions, and focuses on wetlands of the mid-Atlantic. Students learn basics of wetland ecology, including the fate of primary production, hydrology, biogeochemistry, nutrient cycling, plant adaptations and wetland zonation. Students also learn wetland delineation, wetland creation and restoration, and functional assessment techniques.

Course requirements:

Attendance: This course requires a significant time investment over the course of the semester. Students are expected to attend and actively participate in all lectures and field trips. Students are responsible for understanding the university's policies and procedures regarding withdrawing from the course, and be aware of the current deadlines and penalties for dropping classes. There will be at least five field trips over the course of the semester. Field trips may include lectures. Students should plan on devoting most of the day to the field trips: we generally meet on site at 9am, and leave by 3pm; however, some variability should be expected.

Code of Conduct: Please see http://advanced.jhu.edu/wp-content/uploads/2013/01/AAP1101_CodeofConduct.pdf for information on expectations. Students should also read and adhere to JHU's policy on plagiarism: <http://advanced.jhu.edu/students/plagiarism/>. Proper course etiquette regarding communication verbally or electronically shall be required. This is a professional atmosphere and requires appropriate language and decorum fit for students and faculty in an educational forum.

Assignments: Students are to complete each assignment prior to the class lecture or field trip which is specified in the week by week layout at the end of this syllabus.

Short Reports: The field exercises will be written up as short reports. The reports will be due the week after the exercise. Late papers will receive a ten point penalty.

Independent Project: Over the course of the semester, the students (in no more than 3 per group) will design a short investigation project that will be conducted on the field trips. Data will be analyzed statistically and results presented as a professionally written, short research paper. Papers are due at the end of the semester. One grade will be assessed to each group as a whole.

Discussions: Each student will investigate a current topic related to wetland ecology and management, choose one to two key papers/articles, and lead a classroom discussion on the topic (discussion to last about 15 minutes).

Exams: Students are required to take both the midterm exam and the final exam. Topics and chapters will depend on the material covered in the period prior to the exam. Late exams will receive a 10 point deduction for each day late.

Herbarium: Students are expected to build and maintain their own herbarium over the course of the field trips. An example of a simple plant press can be found here: <http://askabiologist.asu.edu/activities/create-your-own-herbarium>. The herbaria will contain the dominant plant species found at each site (identified by the instructor), and will be graded on completeness and accuracy.

Plant practical: Students will be tested on their ability to identify the dominant wetland plant species that were encountered in the field through a plant practical administered near the end of the semester.

Grading:

Short Reports	25 points
Midterm Exam	15 points
Class Discussion	5 points
Construction of a Herbarium	5 points
Independent Project	15 points
Plant Identification Test	10 points
Final Exam	25 points

Grading scale:

98 – 100%	A+
94 – 97%	A
90 – 93%	A-
88 – 89%	B+
84 – 87%	B
80 – 83%	B-
70 - 79%	C
<70%	F

Required Text: Mitsch, W.J. and J.G. Gosselink. 2015. Wetlands. Fifth edition. John Wiley & Sons, Inc.

Recommended Field Guide : Lippson, A.J. and R.L. Lippson. 2006. Life in the Chesapeake Bay. Third Edition. Johns Hopkins University Press.

Additional information:

Field trips could be **all day long**, and we will try to coordinate transportation via carpooling. In general, we meet at the site at 9:00 am and usually will be finished by 3:00 pm. Please be at the meeting location on time. **Expect to get dirty, wet and/or muddy by the end of the day. Waders are a necessity for this class.** You will need a pair of chest waders (preferred) or a pair of hip boots to use for each field trip. Field trips will be held rain or shine.

For the field trips you generally need the following things:

Hip boots, waders, or an old pair of sneakers; hat; sunscreen lotion; insect repellent; pencil; small notebook; lunch and water; raingear; small backpack (to carry all this equipment); and plant sample collecting bags. You may want to bring an extra set of clothes (esp. shoes and socks). Optional: your own flora and fauna identification guides.

Outdoor activities involve certain risks. You should be aware of two of these: poison ivy and insect bites (incl. mosquitoes and ticks). While none of these can be prevented entirely, taking appropriate precautions can reduce risk. When we are in the field (especially in densely vegetated areas) wear shoes with socks, long pants, and a hat. Inspect your clothes and body immediately after returning from the field. Waivers will be handed out on the first day of class to be signed and returned to the instructor at the next class.

Class 1: Lecture 1. September 9, 2017

LOCATION: Washington DC Center (10:00 am – 12:45 pm)

TOPICS/OBJECTIVES: Present overview of course objectives, expectations, and requirements. Lecture on wetlands and human history, use, and science; definitions of wetlands; and wetlands of the world.

ASSIGNMENT: Read Chapters 1, 2, 3 in Mitsch and Gosselink (2015).

Class 2: Field Trip 1, Lecture 2. September 16, 2017

LOCATION: Jug Bay Wetland Sanctuary

Meet at 9 am at the Laboratory/Visitor's Center (tel: 410-741-9330)

Directions: <http://www.jugbay.org/jugbay/directions.html> (about 40 min from DC campus); <http://www.jugbay.org/>

TOPICS/OBJECTIVES: Tour of tidal freshwater wetlands; discussion of seasonal wetlands; field observations of wetland continuum from upland to lowland.

ASSIGNMENT: Read Chapters 4, 10 and 11

Class 3: Field Trip 2, Lecture 3. September 23, 2017

LOCATION: Anacostia Wetlands

Invited Faculty: Dr. Richard Hammerschlag, USGS (retired)

Meet at 9am at the entrance on the RFK stadium lot #6 (farmers market)

Directions: <http://www.kingmanisland.org/maps-and-directions/>

TOPICS/OBJECTIVES: Begin lecture on wetland hydrology. Tour of Anacostia River restored and created wetlands. Discuss process of wetland restoration, lessons learned in the Anacostia.

ASSIGNMENT: Read Chapters 8, 11 and 18

Class 4: Field Trip 3, Lecture 4. September 30, 2017

LOCATION: Chesapeake Bay Environmental Center

Meet at 9:00 am in the Parking Lot (tel: 410 827 6694)

Directions: <http://www.bayrestoration.org/directions.html> (about 1 hr from the DC campus); <http://www.bayrestoration.org/>

TOPICS/OBJECTIVES: Introduction to Chesapeake Bay brackish tidal marshes, and the fate of these marshes facing local sea level rise. Conclude lecture on wetland hydrology.

ASSIGNMENT: Make sure you have read all the above Chapters!

Class 5: Lecture 5. October 7, 2017

LOCATION: Washington DC Center (10:00 am – 12:45 pm)

TOPICS/OBJECTIVES: Lecture on wetland hydrology and information presented in field trips. Prep for field trip next week

ASSIGNMENT: Read Chapters 4 and 5.

Class 6: Field Trip 4, Lecture 6. October 14, 2017

LOCATION: Fort McHenry Wetland Mitigation Site

Invited Faculty: TBA

Meet at 9:00 am at Fort McHenry Parking Lot

Directions: <http://www.nps.gov/fomc/planyourvisit/directions.htm> (about 1 hr from DC Campus); <http://tidesandcurrents.noaa.gov/ftmchenry.html>, <http://www.citypaper.com/news/story.asp?id=3486>

TOPICS/OBJECTIVES: Tour of created/restored wetland. Discuss lessons learned from restoration. Evaluate biodiversity of tidal brackish wetland ichthyofauna, benthic macroinvertebrates, and flora.

ASSIGNMENT: Read Chapters 14 and 18. Development of independent research project. Read US Army Corps of Engineers 1995 wetland delineation manual in preparation for next week's class (see below)

Class 7: Midterm Exam, October 21, 2017

LOCATION: Washington DC Center (10:00 am – 12:45 pm)

TOPICS/OBJECTIVES: Midterm exam on lectures 1-6, Chapters 1-4 and 8,10,11, and information presented in field trips.

ASSIGNMENT: Finish reading Chapter 5.

Class 8: Field Trip 5, Lecture 7. October 28, 2017

LOCATION: Future development area with impacts to wetlands in Baltimore County, Maryland

Guest Speaker: TBA

Meet at 9:00 am (about 1 hr from DC campus)

TOPICS/OBJECTIVES: Discuss wetland classification, wetland laws, wetland protection, and wetland delineation. Conduct wetland delineation exercise.

ASSIGNMENT: Begin preparing short report on delineation exercise, and read Chapters 13 and 15, and the US Army Corps of Engineers 1995 wetland delineation manual:

<http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf>. Also see the following

rendition: <http://www.wetlands.com/pdf/wdm0225e.pdf> This and other

information can be found at: <http://www.wetlands.com/regs/rlpge02e.htm>. Plan

for independent projects and progress on short papers.

Class 9: Lecture 8. November 4, 2017

LOCATION: Washington DC Center (10:00 am – 12:45 pm)

TOPICS/OBJECTIVES: Lecture on biological adaptations to wetland environment. Have class discussions on current topics dealing with wetland ecology and management.

ASSIGNMENT: Read Chapters 6, 7 and 16, continue working on papers

Class 10: Lecture 9. November 11, 2017

LOCATION: Washington DC Center (10:00 am – 12:45 pm)

TOPICS/OBJECTIVES: Lecture on biogeochemistry and hydric soils from guest lecturer.

ASSIGNMENT: Read Chapters 5 and 6, continue working on projects

Class 11: Lecture 10. November 18, 2017

LOCATION: Washington DC Center (10:00 am – 12:45 pm)

TOPICS/OBJECTIVES: Lecture on biological adaptations to wetland environment.

ASSIGNMENT: Read Chapter 19, continue working on papers

Class 12: Lecture 11. December 2, 2017

LOCATION: Washington DC Center (10:00 am – 12:45 pm)

TOPICS/OBJECTIVES: Lecture on wetland ecosystem development.

ASSIGNMENT: Read Chapters 16 and 17, continue working on independent projects, and prepare herbarium

Class 13: Plant Practicum, Lecture 12. December 9, 2017

LOCATION: Washington DC Center (10:00 am – 12:45 pm)

TOPICS/OBJECTIVES: Students discuss papers. Finish lecture on wetland ecosystem development. Plant practicum, hand in herbaria. Discuss/answer questions for final.

ASSIGNMENT: Turn in Fort McHenry papers. Finish independent projects.

Class 14: Final Exam. December 16, 2017

LOCATION: Washington DC Center (10:00 am – 12:45 pm)

TOPIC/OBJECTIVES: Final exam and turn in Independent projects. Note that the final exam is cumulative, and covers textbook chapters 1, the parts of chapters 2 and 3 indicated above, chapters 4 (hydrology), 5 & 6 (soils and biogeochemistry), 7 (adaptations), 8 (tidal marsh), 10 (freshwater marsh), 11 (swamps and riparian), 13 (wetland classification), 14 (human impacts and management), 15 (wetland laws), 16 & 17 (ecosystem services and climate change), 18 (wetland restoration) and 19 (water quality).