

Botany/Zoology 450: Midwestern Ecological Issues
Online Course
2 credits

DRAFT SYLLABUS - 2016

I. GENERAL INFORMATION

Botany/Zoology 450 is taught entirely online.

Login at: <http://uwmad.courses.wisc.edu> using your UW NetID and password.

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TA: TBA

Overview: This 4-week online course will introduce you to ecological issues with particular relevance to the Midwest, and to give you a concrete understanding of how the science of ecology approaches these problems. The course contains four modules, each focusing on an important ecological issue (see Content, below) in the historical and biogeographical context of the Midwest. The dynamic nature of each issue, including challenges and solutions, are presented and illustrated with case studies. You will explore the science behind these issues and learn to think critically about public and private approaches for addressing them.

Content and Learning Objectives:

Students will be evaluated on their understanding of the topics listed under each Module.

Module 1) Environmental History of the Midwest

- the geographical distribution, composition, and basic ecology of historical plant communities in the Midwest
- changes in the Midwestern landscape during European settlement
- the development and exploitation of important natural resources in the Midwest
- loss and fragmentation of natural vegetation and its impacts on biodiversity

Module 2) Modern Land Use and Habitat Loss

- major agricultural production systems in the Midwest, including corn, soy, and livestock, and their ecological impacts
- changes in wildlife populations and the problem of overabundant deer
- the origins, consequences, and control of invasive species

Module 3) Water Resources in the Great Lakes Basin

- patterns of water use in the Midwest
- the links between agricultural practices, eutrophication, and water quality

- human health risks associated with water pollution
- the major aquatic invasive species and their ecological and economic impacts

Module 4) Climate Change Impacts in the Midwest Region

- energy use and the impacts of increasing urbanization and sprawl
- shifts in species range and phenology, and other biological responses to climate change
- climate change impacts on agricultural productivity
- climate change impacts on water resources

Course Structure: This is an entirely web-based course. Each module consists of several online lectures and readings, culminating in an online quiz. There also will be several ongoing discussions. It is *your responsibility* to keep up with course content and inform yourself of due dates for all assignments and quizzes. While the online format offers you flexibility in accessing course content, you are expected to complete each module prior to the quiz for that module. Before you begin the course, please familiarize yourself with the schedule, policies, and procedures detailed in this syllabus. Take some time also to explore the course website and familiarize yourself with the organization and navigation of course content and other utilities.

Lectures and Readings: Virtual lectures and video content are organized into 6-8 hours of content per module, accessible via the **Content** section of the course webpage. You are responsible for viewing online material and doing the readings in time for scheduled quizzes and assignments. Whether you create a schedule for yourself to "attend" the course several times per week or employ some other way of organizing your time, follow the syllabus so that you do not get behind on the material. Of course you may read ahead at anytime, but homework, quizzes and tests will only be available during specified time periods.

Quizzes/Exams: There will be one quiz on each of the modules, plus a final exam, all given online through Learn@UW. They will be made up of multiple choice and short answer questions. *It is your responsibility* to know when the quiz is available to take, and you may take the quiz anytime within that period. Check the syllabus and online course schedule often to remind yourself of when quizzes and exams will be given. Most quizzes will be available for 2-3 days, though you can only take the quiz once. We will also post a reminder when a quiz becomes available in the **News** section on the course home page. **Quizzes and Exams** are accessed via the link of the same name on the course home page.

Assignments: Each module will have one or more short assignments associated with it, with due dates given in the course schedule, and on the assignments page. These will vary, but may include a short writing assignment, reading, a web-based activity, or an activity you complete off-line. The assignments are accessible via the **Assignments** link on the course home page. Your completed assignment will be submitted using the **DropBox** utility in Learn@UW. *Do not email your assignment to your T.A. or professor* -- it will NOT be evaluated for a grade by this means unless you are specifically instructed to submit it this way.

Discussions: You are assigned a discussion group early in the semester and are expected to participate at least two times per module topic, or a total of 8 times during the course (see Grading and Evaluation below). Discussions will be organized by topic. Although your instructors may post

questions or comments to the group, please note that the discussion group should not be used to communicate with your instructors regarding your specific questions -- rather the discussion is an opportunity for you to communicate with fellow students enrolled in the class on the topics and problems presented as course material. Access your discussion group by clicking on the **Discussion** link on the course webpage. You should **ONLY** post messages that are relevant to the discussion topic! We have included "topics" such as Study Groups and Website Issues for you to post messages to other students looking to form a study group or sharing helpful information on using the course website. Do not use the discussion group for inappropriate, irrelevant, or personal purposes. If you do you are subject to the rules governing academic misconduct (see below).

TA contact: You may contact your TA with questions on course material, specific details on assignments, special needs, comments, and other issues and information related to course content. Your T.A. will also hold a "Virtual Office Hour" at a specified time, one hour per week when she/he will be available online to immediately answer your questions, chat-room style. Access this office hour by clicking on the **Chat** link on the main navigation bar. Please take advantage of this hour as your T.A. will have limited time available for answering course-related email outside this "virtual office hour".

Other Email and Communication: By enrolling in the course you are automatically part of the course mailing list. Please check your email often (at least once a day). **Read the emails the TAs and instructors send out! Most of your questions will be answered by there.** You should also check the *News* section on the main course page for important announcements.

Expectations and Grading: As a 2-credit class, the expected workload is approximately 30 total hours over the 4-week period in direct contact with course content, plus additional "out-of-class" hours working on assignments and studying. Grades will be based on student performance as evaluated via points accumulated from assignments, quizzes, online discussions, and a final exam. Each item is weighted as follows in your final grade:

	%
Quizzes	30%
Assignments	30%
Participation	20%
Final exam	20%
TOTAL	100%

Grading scale: A = 92-100%, AB = 88-91.9%, B = 82-87.9%, BC = 78-81.9%, C = 70-77.9%, D = 60-69.9%, F = <60%

You are encouraged to keep track of your progress and your grades. Your grades for assignments and quizzes will be posted within one week after the due date. Grades for participation and the final

exam will be posted at the end of the semester. You can access your grades through the **Grades** link on the course home page.

System Requirements: You must have an active UW email account to take part in this course. All messages regarding the course schedule and assignments are sent out to your UW email or posted directly on the course home page.

You also must have access to the internet and a computer capable of running a suitable browser, including Firefox, Chrome, Safari or Internet Explorer. We recommend you update Flash plug-ins in your browser to minimize problems viewing content. You also need Adobe Acrobat to view PDF files. If you have any issues viewing course content, please contact the DoIT Help Desk.

Note: UW campus InfoLabs have computers with all of these features and fast connections. If you are on the UW-Madison campus we suggest you use the UW InfoLabs for this course.

Independent Work and Academic Conduct: In this course, we encourage you to explore ideas via readings, web sites, and interactions with fellow students and the instructor(s), and express yourself via the online forums. However, when it comes to the homework, quizzes, and tests, *work alone and independently*. Because this is a course with indirect instructor contact, you may be tempted to obtain your answers from somewhere or somebody else. Don't do it unless explicitly directed to work collaboratively. It is as easy for us to check the internet for copied material as it is for you to copy it. We will check assignments for appropriate use of online source material.

If you submit material that is not your own work, or obtain information under false pretenses, you are subject to some pretty heavy penalties under the [UW Academic Misconduct](#) rules. It is every student's responsibility to be familiar with these rules. If you are ever in doubt, ask.

Getting Help: If you need help using Learn@UW or navigating the course web site, please first check the online help by clicking on the **Help** link on the upper right of the course home page. You may also consult the [DoIT Help Desk](#). For questions about due dates and instructions for quizzes, exams or assignments, check the attached schedule as well as the appropriate links online. For questions on course material, or other issues not resolved using online help, email your professor.

Tentative Lecture Topics and Readings List

Module 1) Environmental History of the Midwest

- Topic 1: Climate and vegetation of the Midwest
- Topic 2: Sod-busters: European settlement in the prairie region
- Topic 3: Loggers and fur-trappers: Early resource exploitation
- Topic 4: The rise of environmentalism in the Midwest
- Topic 5: Agricultural expansion and industrialization

Sample Readings:

- Barbour, M. G. 1996. "Ecological fragmentation in the fifties." In *Uncommon Ground*, ed. W. Cronon, 233-255. New York: W. W. Norton & Co.
- Madson, John. 1982. "Fire, ice, and mountain." Chapter 2 In *Where the Sky Began: Land of the Tallgrass Prairie*. Boston: Houghton Mifflin
- Leopold, Aldo. 1970. "Good Oak." In *A Sand County Almanac*, pp. 6-18. New York: Ballantine Books.
- Vale, Thomas R. 1997. "From end moraines and alfisols to white pines and frigid winters: An introduction to the environmental systems of Wisconsin." Chapter 1 In *Wisconsin Land and Life*, eds. Robert C. Ostergren and Thomas R. Vale. Madison: University of Wisconsin Press.

Module 2) Modern Land Use and Biodiversity Loss

- Topic 6: Roads, habitat fragmentation, and loss of biodiversity
Video: Monitoring Forest Change in WI – *Don Waller*
- Topic 7: The pros and cons of hunting
- Topic 8: The problem of overabundant deer
- Topic 9: Invasive species
- Topic 10: Conservation farming and forestry practices
Video: The USDA-NRCS incentive programs for landowners – *Tom Krapf*

Sample Readings:

- Frerker, K.L., A. Sabo, and D.M. Waller. Deer impacts on forests: Linking local experiments to long-term regional changes. PLoS-ONE.
- Rogers, D.A., T.P. Rooney, T. Hawbaker, V. Radeloff, and D.M. Waller. 2009. Paying the extinction debt in southern Wisconsin forest understories. *Conservation Biology* 23: 1497-1506.

Module 3) Water Resources in the Great Lakes Basin

- Topic 11: The Midwest as a water resource
- Topic 12: Industrial agriculture, eutrophication and water quality
- Topic 13: Livestock production and water quality
- Topic 14: Frac sand mining and water resources
- Topic 15: Aquatic invasive species
- Topic 16: Policies and practices to protect water resources

Sample Readings:

- Lovell, et al. 2007. The Economic Impacts of Aquatic Invasive Species: A Review of the Literature. *Agricultural and Resource Economics Review*. 35:195-208.

Great Lakes Water Resources Compact and Agreement. <http://www.greatlakes.org/compact>
Schelske, C. et al. 1983. Early Eutrophication in the Lower Great Lakes. *Science*, 21:320-322
Wisconsin Department of Natural Resources. 2012. Silica Sand Mining in Wisconsin.
<http://dnr.wi.gov/topic/Mines/documents/SilicaSandMiningFinal.pdf>

Case Study: Wisconsin's Livestock Facility Siting Law,
http://midwestadvocates.org/assets/resources/An_Overview_of_the_Livestock_Siting_Law.pdf

Module 4: Climate Change Impacts in the Midwest Region

Topic 17: Population growth, urbanization, and sprawl

Topic 18: Agriculture and climate change

Topic 19: Biological impacts of climate change

Topic 20: Impacts of climate change in the Midwest

Topic 21: Midwestern solutions to climate change

Sample Readings:

Pryor, S. C., D. Scavia, C. Downer, M. Gaden, L. Iverson, R. Nordstrom, J. Patz, and G. P. Robertson, 2014: Ch. 18: Midwest. *Climate Change Impacts in the United States: The Third National Climate Assessment*, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 418-440.