

ENVS 302: ENVIRONMENTAL SCIENCE II: BIOLOGICAL SYSTEMS

Fall 2016

TUESDAYS AND THURSDAYS 9A-10:15P

DU 204

Instructor: Dr. Holly Jones, hjones@niu.edu

Office: MO 448

Office Hours: Weds 10A-12P or by appointment

TA: Kirstie Feller

Email: kfeller@niu.edu

Office Hours: Thurs 12:30-1:30P or Fri 9-11A in MO 424

Course Description

Welcome! This course provides an overview of the field of environmental science from the biological perspective. Specifically, we will explore concepts including: environmental problems and problem solving, sustainability, biodiversity, population control, the causes and consequences of biodiversity loss, ecosystem structure and functioning, how to read and interpret environmental data, climate change, and invasive species. You will learn about these concepts and we will focus our activities and discussion on how to approach environmental issues. Class sessions will be a mixture of lecture, team-based projects, and in-class case studies/activities.

There is no required text for the course. The readings for class will be primary literature. An optional textbook: Miller, G.T. & Spoolman, S.E. (2012). *Environmental Science* (14th edition). Belmont, CA: Brooks/Cole. This is for those of you who want reinforcement of the concepts we will cover in class and/or those who hope to go on to graduate school in environmental science.



Technology Resources: You will be using Blackboard for this course to access readings and assignments, as well as communicating with your classmates and me. If you need help using Blackboard, please contact the ITS help desk (815-753-8100) and/or view the tutorial here:

<http://www.niu.edu/blackboard/students/>

Course Goals and Objectives

Given the broad scope of this course, my primary goal is to help you build foundational knowledge in environmental science research and knowledge. Taking this course is much like joining a physical fitness center, but with an emphasis on mental rather than physical development. I will provide you with the resources/tools and coaching (like a personal trainer) to learn the material, but you are ultimately responsible for the learning outcomes. The course material and assignments are designed to help you meet the following objectives (and hopefully have just a little bit of fun doing it):

1. *Understand and Articulate the Science of the Environment:* Identify, discuss, and recall major theoretical and empirical concepts in environmental science. Demonstrate conceptual knowledge retention and written/oral communication skills in course activities.
2. *Learn to Think and Act Like an Environmental Scientist:* Integrate and synthesize scientific knowledge of environmental issues to provide evidence-based recommendations to agencies, non-profits, and other stakeholders. Demonstrate team collaboration competencies (i.e., communication, problem-solving, management, and accountability) critical to both academic and applied work settings.
3. *Recognize and Discuss the Relevance of Environmental Science to Every Day Life and Current Events:* Demonstrate the integration and application of scientific knowledge of environmental science in reflections on personal life choices/experiences and relevant current events.

Syllabus as a Contract: This course syllabus should be considered a contract. By enrolling in the course, you agree to the policies discussed below. Likewise, I agree as instructor to abide by these policies. Any changes will be announced in class and through Blackboard and will be minor (e.g., changing the lecture topic of a day, but not the day of an exam). Be familiar with the policies discussed here. If you ask me a question that is answered in the syllabus, the likely response will be: "Read the syllabus."

Attendance: Class attendance is required, as we will be actively interacting in groups and working on projects in class. If you are absent, you will let your group down and it will be counted against your grade. Please note that late arrivals are disruptive and will not result in credit. If you are 15 or more minutes late, please do not come to class as you will not receive credit for the class activity and will interrupt the learning of your peers.

Respectful Learning Environment: Please show engagement and respect for the classroom learning environment by turning off all electronic devices. I reserve the right to confiscate cell phones that are used in class for the duration of class – including those used for texting. Note-taking on electronic devices has been empirically shown to be distracting to other students, so use of laptops will be restricted to the back row. Class discussion and debate are highly encouraged (and will be facilitated) in this class, but only in a professional and respectful manner.

Academic Integrity: A certificate of completion (with scores) from the university's Online Tutorial of Academic Integrity (<http://www.niu.edu/ai/students/>) is required at the beginning of this course. Instructions can be found here: <http://www.niu.edu/ai/students/certificate.htm>. If evidence of academic dishonesty is detected, depending on the circumstances, you will at the very least receive a zero for that assignment and one warning. At the instructor's discretion, academic dishonesty may be immediately reported to higher campus authorities. Repeat incidents may result in course dismissal or failure.

Late Work: The ability to meet and manage work deadlines in light of other responsibilities is a critical component of professionalism. Late work will not be accepted so please do not ask. However, early work is always accepted!

Writing: For any writing assignment in this class, you will be graded for clarity, grammar, and punctuation. You will not receive full points for online discussions and other written work if you have made grammatical or spelling errors or don't write clearly. Writing is one of the most important skills you have to gain and if you aren't yet comfortable with writing, I encourage you to use NIU's Writing Center to help you.

Email Etiquette: Email is the best way to reach me. But, in the spirit of promoting healthy work-life balance, please keep in mind the following email etiquette guidelines: (1) indicate the course in the subject line and topic (e.g. ENVS 302 Syllabus Question), (2) use proper grammar/punctuation and address me respectfully (I'm not fluent in "text talk" and it's disrespectful to not sign on and off of email communications), (3) expect responses Monday-Friday between 9:00am and 5:00pm, with at least a 48-hour time lag, (4) check the syllabus or Blackboard before asking questions, and (5) reserve grade discussions for office hours. Not following these guidelines may result in my not answering your email.

Special Accommodations: I am happy to provide special accommodations for students with documentation of a disability through the Center for Access-Ability Resources (CAAR). Please contact me as early in the semester as possible. CAAR is located on the 4th floor of the University Health Service Building (815-753-1303).

Student Support and Services: As a student, you may experience a range of issues that can negatively impact your learning, such as anxiety, depression, interpersonal or sexual violence, difficulty eating or sleeping, loss/grief, and/or alcohol/drug problems. These mental health concerns or stressful events may lead to diminished academic performance and affect your ability to participate in day-to-day activities. In order to support you during such challenging times, Northern Illinois University provides a number of confidential resources to all enrolled students, including Counseling and Consultation Services 815-753-1206, Advocacy Services for Sexual Assault, Dating Violence and Stalking Support 815-753-1206 [24- Hour Crisis Assistance: Public Safety at 815-753-1212], and Services for Students with Disabilities (drc@niu.edu) or phone: 815-753-1303. If you are experiencing any sorts of these issues that prevent you from attending or doing well in class, please come talk to me at your earliest convenience and seek a doctor's note.

Online Discussion Assignments

Each week, students will read a range of literature that will form the foundation of their knowledge of the issues. Every student is required to write a review on the readings and write a comment on a fellow student's review. The point of these reviews and comments is to spark some dialogue about course topics and raise any questions you might have about the readings. Reviews and comments will be made via the Discussion Tab on Blackboard.

Reviews are due Sunday nights at Midnight for the following week's readings. The first review will be due the first Sunday after classes Start - Sunday, August 28th. Comments are due Tuesday nights at Midnight. You will not get credit for late reviews/comments regardless of computers crashing, skies falling, etc.

Reviews should be a **short** paragraph and should include any opinions or thoughts you have on the readings, anything you've done or read in your life outside of class that may pertain to the subject, and every review should end with 1-2 questions you have based on the readings. Please do not just summarize what you read or you will not receive credit. These reviews should be thoughtful and thought provoking, not a rehash of what you read. Comments should be a short response to any of your fellow students' reviews. Keep it clean and respectful, please.

Environmental Service Learning Experience

In order to obtain firsthand experience of environmental science in action, all students will participate in a volunteer opportunity with local practitioners outside of class time. Links to upcoming activities in the region are posted on blackboard. If there is an opportunity you are aware of or wish to participate in that is not included in these links, please let me know beforehand because I will need to approve it and can add it to Blackboard.

Following the participation, you will write a 2-3 page description and reflection on the experience detailing the activity and its goals, successes and challenges of the project, and an assessment of whether you think the goals will be achieved. During the activity, be sure to ask leaders about the project. The paper is due by the start of class on December 1st, but may be turned in at any time (and completing the paper soon after the experience would be prudent). It must be typed, double-spaced, with 1"-margins and 10-12-pt. font.

Team-based Projects

In the beginning of the class, I will have you use the CATME website to answer questions that will help choose groups for our team-based learning projects. This will be your group for all three team-based projects I assign. Team-based projects are in-depth investigations on a particular subject of your choosing based on a prompt from me. There will be assigned class time to work on team-based projects so that I can help you with any issues **but you are expected to work extensively outside of class on these projects as well.** I reserve the right to remove people from teams and give zero points for group scores to those who are not communicating with their team members and show no effort in the team-based work while projects should be progressing. If you do not show up for a team-based workday you will automatically lose 20 points from your course engagement score no matter the reason. I am giving you valuable class time that I could otherwise use teaching in order for you to work diligently on your projects; I expect you to be in class to make this sacrifice of class time worth it.

Each project will have two outputs: an in-class Powerpoint presentation and a paper from your group. You will be graded as a group and individually for team-based projects. Group members will evaluate one another and those evaluations will contribute to your individual grades, so it is in your best interest to be a good team player. You will also put your names on individual sections of the paper (more than one person can work on a section) and that will also contribute to your individual grade. Your in-class presentations will be evaluated by me.

The goals of the team-based projects are to expose you to working in groups and teach you to effectively work as a team member. Most of environmental science is accomplished in interdisciplinary groups of people since most environmental problems span multiple disciplines, stakeholders, and institutional boundaries. Learning to work effectively in a group and reflecting on which skills you bring to groups will go a long way into making you a valuable employee down the road.

In-class case studies

For in-class case studies, you will be formed into groups (different than for your team-based projects) to address some questions or prepare for a class debate on the topic at hand. The case studies are designed to illustrate and provide depth to concepts covered in lecture or in the readings. You will hand in a piece of paper with the groups' names and answers at the end of each class. Answer keys and case studies will be posted on Blackboard.

Field trips

We will have two class field trips, on Saturdays. Always be sure to dress appropriately for weather conditions and inform me of any pertinent medical concerns. Buses leave from the front of Davis Hall at the time discussed. You must be on time as we will leave at the time listed. If you can't make it to a field trip, you can make up the points with extra credit (up to 40 points per semester).

The field journal should document what was observed and/or learned on each of the field trips. The writing style should be informative and descriptive, but not verbose. It should be written in complete sentences. Each entry must include:

1. Date
2. Time
3. Location
4. Weather conditions
5. Activities
6. Observations
7. Conclusions

I recommend using a small spiral-bound notebook for notes during field trips. Submit field journals using the journal function on Blackboard. Examples of field journal entries will be available on Blackboard. The field journal entry is due on Blackboard at Midnight one week after your field trip. For example, if your field trip is on Saturday, your journal entry is due on Saturday at Midnight the following week.

Extra Credit Opportunities

Please note the last day to submit extra credit is the last day of class (1 December) by Midnight. You may earn up to 40 points of extra credit in the semester. You may attend any environmental science-oriented seminars on campus to receive 10 points of extra credit. You must email the TA with the following to receive credit:

1. The name of the person who spoke and title of the talk.
2. What you learned and how it's relevant to environmental science.

Extra credit write ups are due within 72 hours (3 days) of seeing the talk. I do not take late work so get the write ups in on time for credit. Biology seminars are Thursdays from 3:30-4:30 in MO 443. Please also check the ESE Institute's website for other opportunities and I'll keep a list on Blackboard as well. If you think a seminar should count, talk to me beforehand because I will need to approve it.

You can receive 30 points of extra credit for one day (approximately 3-4 hours) of volunteer work at Nachusa Grasslands, Afton Forest Preserve, St. Charles Park District, or any other of the Environmental Science

Opportunities listed on Blackboard that are 3-4 hours as well. You must turn in (to your TA) a sheet of paper that details:

1. The date attended,
2. the work you performed, and
3. what you learned.

Extra credit write-ups are due within 72 hours (3 days) of volunteering. You must have a steward or employee of the place in which you are volunteering print and sign their name on the sheet of paper (you don't need to have covered what you learned when they sign) or email the TA to get credit for your work.

This volunteer experience has to be distinct from your Environmental Science Learning Experience. You can volunteer at any of these places for your learning experience, but if you want extra credit, you will need to volunteer a second time.

Student Evaluation

Grades for this course are determined from a 0 to 1000 point-scale, and include the following activities:

Course Engagement (140pts; 14%): This evaluation includes completion of the academic integrity tutorial certification (10 pts), online discussion assignments (14 x 4 pts = 56pts) for readings assigned for class, and a grade from me based on your attendance and participation throughout the semester (74 pts).

Exams (150pts; 15%): We will have one midterm and one final exam, each worth 75pts. The midterm will be on topics covered up until then and the final will be cumulative. Both tests will be based on material covered in class and readings. Both will consist of definitions, multiple-choice questions, short answers, and essays.

Environmental Science Learning Experience (60pts, 6%): You will write a 2-3 page description and reflection on the experience detailing the activity and its goals, successes and challenges of the project, and an assessment of whether you think the goals will be achieved. A rubric will be available on Blackboard.

Team-based Project Presentations (210pts, 21%): You will do three group presentations in class to present your team's project for each team-based project prompt. I will evaluate your presentations (66.66 pts per presentation). Each student will also receive an individual score for their presentations throughout the semester (10 pts). Each group member must present at least one time throughout the semester. Rubrics will be available on Blackboard.

Team-based Project Papers (270pts; 27%): Your team will write three papers in response to the team-based project prompts. You will receive an individual score for the sections of the paper that you write (80 pts per paper) and your group will also receive a score for the paper holistically (10 pts per paper). Rubrics will be available on Blackboard.

Team-based Project Participation (90pts; 9%): Your group will evaluate you as a team member for each different project (30 pts per project). Rubrics will be available on Blackboard.

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In class case studies (30pts; 3%): You will do three in-class exercises to illustrate concepts covered in readings and lectures. You will be required to participate and execute the required assignments for each case study (10 points per case study).

Field Trips (50pts; 5%): We will go on two field trips over the semester, with dates/times to be announced. You will complete a journal entry for each field trip (25 pts each).

Letter grades are distributed according to the following point ranges: A (920-1000), A- (900-919), B+ (880-899), B (820-879), B- (800-819), C (720-799), D (620-719), and F (<620).

Grades are non-negotiable. The only time I will consider changing a grade is if you think I have made a mistake adding points. I will not change points or give you more credit for any other reason.

Course Schedule

Date	Topic	Reading	Assignment	Due Today
Aug. 23	Course Introduction, Scientific method/Reading graphs and maps	http://data.heapanalytics.com/how-to-lie-with-data-visualization/	Sign up for CATME website and answer survey questions	
Aug. 25	Sustainability and environmental issues	Millennium Ecosystem Assessment; Foley et al. 2005		
Aug. 30	How to cite sources; Using NIU's library resources to search for scholarly material; Internships at NIU	Carlson 2006; Sharp 2009		CATME online survey
Sept. 1	Team-based Project 1 Introduction and In-class work	Green Manhattan by David Owen	Team-based Project 1: Create a program for NIU that can increase campus sustainability	Academic integrity certificate*
Sept. 6	Ecosystems, food chains, and energy	LeBauer and Treseder 2008; 876-878 from Geider et al. 2001		
Sept. 8	Ecosystems, food chains, and energy	Ernest et al. 2003		
Sept. 13	In-class case study: Mystery in Alaska	Mooney 2010 PNAS; Womble and Sigler 2006		
Sept. 15	Food, soil, and pest management; How to give a good presentation	Pollan Omnivore's Dilemma selections		
Sept. 20	Food, soil, and pest management 2	Saletan – Unhealthy obsession; NAS pp 90-100		
Sept. 22	Team-based Project 1 In-class work	Uhl and Anderson 2001; Tilman et al. 2002		

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Date	Topic	Reading	Assignment	Due Today
Sept. 27	Teams present Team-based Project 1	Beschta and Ripple 2009		Papers and presentations for Team-based Project 1*
Sept. 29	Team-based Project 2 - Introduction and in-class work	Hutchinson 1959; Hairston et al. 1960	Team-based Project 2: Identify a top-predator in peril, document the reasons for its decline, the effects of its decline on ecosystems, and suggest techniques to help it recover	Group member evaluations for Team-based Project 1*
Saturday, October 1st. Field trip to Angelic Organics. Meet in front of Davis Hall at 9:45A. We will be back at 3:15PM. You can drive yourself and meet us at the Angelic Organics Learning Center if you wish.				
Oct. 4	In-class case study: Isle Royale	Pauly et al. 1998		
Oct. 6	Nutrient cycles, biodiversity, and evolution	pp 853-854; 868-869 from Geider et al. 2001		
Saturday, October 8th	Second field trip to Genoa Wetland restoration. Meet in front of Davis Hall at 8:30AM. We will be back by 12:30pm. You can drive yourself and meet us in the park across from the Genoa water treatment plant.			Field Trip 1 Journal due at Midnight
Oct. 11	Midterm exam			
Oct. 13	Biodiversity loss, species interactions, and population control	Heithaus et al. 2008; Jones et al. 1994		
Saturday, October 15 th				Field trip 2 journal due at Midnight
Oct. 18	Biodiversity loss, species interactions, and population control 2	Paleczny et al. 2015 (skip methods)		
Oct. 20	Team-based Project 2 in-class work	Mittelbach et al. 1995; Prugh et al. 2009; Ritchie et al. 2009		
Oct. 25	Teams present Team-based Project 2	Patz et al. 2005; McMichael et al. 2006		Papers and presentations for Team-based Project 2*

Date	Topic	Reading	Assignment	Due Today
Oct. 27	Team-based Project 3 - introduction and in-class work	Haines et al. 2006; Hill et al. 2009; Allan et al. 2010	Team-based Project 3: Identify a human health issue that is linked to climate change and the environment and describe potential ways to combat the issue.	Group member evaluations for Team-based Project 2*
Nov. 1	Climate and biodiversity	Thomas et al. 2004		
Nov. 3	Climate and biodiversity 2	Heller and Zavaleta 2009		
Nov. 8	In-class case study: Iron fertilization	Chisholm et al. 2001; Cao and Caldeira 2010		
Nov. 10	Sustaining biodiversity	Jones and Kress 2010		
Nov. 15	Sustaining biodiversity 2	Turner et al. 2012; Costello et al. 2013		
Nov. 17	Team-based Project 3 in-class work			
Nov. 22	Teams present Team-based Project 3	Bogardi et al. 2012		Papers and presentations for Project 3*
Nov. 24	No Class. Happy Thanksgiving!!!			
Nov. 29	Solutions to environmental problems	Jones and Schmitz 2009		Group member evaluations for Team-based Project 3*
Dec. 1	Final Exam			Environmental Service Learning Experience*; All extra credit emailed to TA by Midnight
* - Assignments due on Blackboard before lecture begins. Please note: <u>Late work is not accepted</u> under any circumstances.				

Getting Started: Carefully review this syllabus and complete the Online Tutorial on Academic Integrity ("Tutorial" folder in Blackboard). A certificate of completion must be submitted on Blackboard under the "Submit Academic Integrity Certificates here" tab by Tuesday, September 1st at the beginning of class. To submit an electronic copy of your tutorial, you must take a screen shot of your certificate. Google how to take a screen shot with your operating system (windows or mac) if you don't already know how to do so or take a picture with your smart phone.

Read early and often to do well in this course! We cannot cover all the reading concepts in class; class time is best served exploring key concepts and hands-on exercises. Thus, the readings are meant to provide you with course information breadth (classroom time offers depth).

Office Hours & Appointments: To ensure one-on-one availability, please email me to schedule an appointment.

More about Environmental Science: I'm always happy to talk to students more about undergraduate experiences and graduate studies in conservation/environmental science. ☺ Please schedule an appointment with me if you want to learn more!