

Indiana Academy for Science, Mathematics, and Humanities
SCI04327 AP Environmental Science I Fall 2024

Instructor: Donald Winslow, Ph.D.

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Office hours: MWF 9:00-10:30; Tuesday 9 AM-noon and 2-2:30 PM; Thursday 9:00 AM-11:00 AM

Class meetings: In Burris 211. MWF 2-2:50 PM, Lab Thursday 2-3:45 PM

Some “laboratory” activities will be field excursions; *i.e.*, we will conduct them outside.

Description:

From the course catalog (<https://academy.bsu.edu/catalog/>):

Prerequisite: One year biology

Co-requisite: AP Environmental Science Lab (SCI04327L)

Credit: 1.5 credits

Offered: Fall/Spring Sequence

The study of environmental science concerns itself with the interaction between humans and the ecosystems in which we live and work. The course focuses on the determination of environmental quality through a series of laboratory experiences dealing with soil, water, and air resources. There is a concentration on problems having to do with population, pollution, agriculture, resource management and land use. An integrated approach to the issues facing us is emphasized. The course will use a problem-based learning approach and will incorporate a service learning component. Students will prepare for and are encouraged to take the AP Environmental Science exam in May.

Student learning outcomes:

Upon completing this course, students will be able to describe the ways in which human societies interact with their environments, apply the concepts of resource limitation and sustainability to discuss the complex issues involved in the resolution of environmental conflicts, and practice field and laboratory analytic techniques to assess environmental quality.

Course materials

Friedland, Andrew; and Rick Relyea. 2023. *Environmental Science for the AP Course*, 4th ed., Bedford, Freeman & Worth: New York.

Molnar, William. 2011. *Laboratory Investigations for AP Environmental Science*, 2nd ed., People’s Education, Saddle Brook, NJ.

Nash, Roderick Frazier. 1990. *American Environmentalism*, 3rd ed., McGraw-Hill: USA.

We will supplement these texts with other relevant material throughout the semester. You should also have a lab and field notebook (separate from your lecture notes) for recording data for lab exercises.

Please note that some aspects of this course may need to be changed during the semester, so this syllabus is subject to revision. If the syllabus is revised during the semester, the updated syllabus will be posted on Canvas. Please refer to Canvas for updated information.

Assignments:

Assignment	Points	Number	Total
Quizzes and workbook activities	100		100
Reports and presentation	100		100
Lab write-ups	100		100
Homework	50		50
Lecture exam	100	4	400
Lab notebook	100	1	100
Comprehensive final exam	150	1	150
Total			1000

Grading Scale:

100 – 93% = A	< 90 – 87% = B+	< 80 – 77% = C+	< 70% = D*
< 93 – 90% = A-	< 87 – 83% = B	< 77 – 70% = C	
	< 83 – 80% = B-		

Grades will be posted on Canvas and synced to Powerschool. If I am late posting grades, you can estimate your current grade in the course by adding all the points you have earned or anticipate earning from all assignments. There are 1000 points available in the course, so each point is worth 0.1%. Please make an appointment to talk with me if you are concerned about your grade or uncertain about your standing in the course.

Attendance

Please arrive on time to class. The instructor is required to take attendance so that all students are accounted for. If you arrive late to class, someone might start checking to see where you may be. If you are late, you may need to remind the instructor to change the absence to tardy. This will disrupt our workflow and possibly the workflow of others, so please try to avoid being late.

If you miss lecture for any reason, you are responsible for obtaining any notes, announcements, reading material, or assignments from the instructor or a classmate. If an unavoidable conflict, emergency, or illness prevents you from attending class or completing an assignment on time, please inform the instructor as soon as possible (preferably beforehand). The Academy and not the instructor determines whether an absence is excused or unexcused. No direct grade penalty is assessed for an absence. However, you will have a much greater chance of success if you are present as much as possible.

Indiana Academy Absence Policy

It is the policy of the Indiana Academy that any absence from class is unexcused, except for illness, death in the family, college or school-related activities, and extenuating circumstances. When a student is absent from a class, the instructor reports the student absence to the Faculty Attendance Coordinator in the Office of Academic Affairs. Unless the absence is excused by a school official, it is considered unexcused. The decision as to whether an absence is excused is not determined by the instructor. Four or more unexcused absences in any particular class a student takes will lead to academic and residential consequences to be determined by the

Office of Academic Affairs and the Office of Residential Life that may include detention, residential groundings, parent/principal conference, among others.

Academic conduct

It is important to prepare for each class meeting by completing the reading and any assignments that are due. Assignments should be submitted on Canvas or in class, depending on the assignment. Although some activities such as labs may be completed in pairs or groups of students, each student is individually responsible for submitting assignments with original writing (not copied from your lab mate). You are encouraged to discuss answers to lab activities with other class members, but the wording should not be the same. Do not share word processing files with each other, but make sure each student has access to the raw data for analysis.

You are expected to conduct yourself according to the Indiana Academy Student Handbook (<https://academy.bsu.edu/handbook/>), especially the Code of Conduct and the section on Academic Integrity. On writing assignments, please be sure to use your own wording and cite all sources of information, whether from the Internet or otherwise. If you are not sure how to cite something, ask the instructor. Note that language copied verbatim from a book, website, another student's paper, or any other source is considered plagiarism unless it is in quotation marks and cited. Plagiarism is a form of academic dishonesty. Please do not plagiarize or cheat in any other way. An infraction may result in a 0 for the assignment. Also, the instructor is required to report any ethics violations to the Academic Integrity Board or (the Director of Academic Affairs and your parents).

Artificial intelligence (AI) technology

Technologies referred to as “artificial intelligence” (AI) are becoming increasingly salient in our lives, sometimes with more emphasis on artificial than on intelligence. The original Turing test (Turing, 1950) for artificial intelligence is to engage in dialogue with what we would now call a “chatbot”. If the discourse is indistinguishable from that of a human, then it is considered artificial intelligence. Modern large language models such as ChatGPT (OpenAI, 2022) exemplify this approach by stringing together words from human writing to sound intelligent (without always being intelligent).

These tools can be very useful, from simple spellchecks to generating computer code. As we adopt these technologies, however, it is important to verify that information obtained is correct and to avoid presenting as our own work that was produced by software or anyone else. We can avoid these pitfalls if we use the auto-generated content as a starting point but not as a finished product. Find the original sources of information and cite those. ChatGPT has a reputation for making up references that don't exist, so don't rely on it.

References and resources on AI:

OpenAI. 2022. ChatGPT, Version 3.5. OpenAI, accessed 12 May 2024 at <https://chatgpt.com/>.

Turing, Alan M. 1950. Computing machinery and intelligence. *Mind* LIX(236):433-460, <https://doi.org/10.1093/mind/LIX.236.433>, accessed 12 May 2024 at <https://academic.oup.com/mind/article/LIX/236/433/986238?login=false>.

Classroom conduct

Please be considerate of other classmates. Keep any devices not used for classroom activities silenced or off. Use of electronic devices during class can be distracting to yourself and others and interfere with the learning process. Your phone should be put away if it's not being used for class. A new Indiana state law prohibits the use of phones in class by high school students except during an emergency or when being used for class activities with the instructor's permission. Laptops can be used in class for class activities, but repeated use for non-class activities may result in a loss of that privilege. A calculator (but not a phone) may be used for exams.

IA Wireless Device Policy:

Pursuant to Indiana Code 20-26-5-40.7, The Indiana Academy for Science, Mathematics and Humanities prohibits student use of wireless communication devices for non-instructional purposes in the classroom. As such, any and all portable wireless devices, that have the capability to provide voice, messaging, or other data communication between two or more parties, must only be used for academic purposes directly tied to the classroom activity or related educational task. Exceptions to this wireless device policy are eligible through academic accommodations, individualized education programs, or with instructor approval permitting the use of a wireless device for justification related to health, safety, and/or well-being. The improper use of a wireless device in an active classroom setting is subject to disciplinary action including but not limited to; a verbal warning, temporary seizure of said device by a school official, an unexcused absence for the class in question, written communication to parent/guardian, among other elevated consequences for repeated improper use.

Please treat each other with respect and refrain from annoying behavior. Do not interrupt another student or the instructor. If you are having difficulty getting a word in, you can raise your hand. Examples of improper conduct include having extended conversations, working on assignments for other courses, sleeping, etc. Serious and/or chronic problems may be cause for dismissal from the course.

Late work

If you are late submitting an assignment because you missed class, see the section above on attendance. If an absence is excused by the Academy, the instructor will make every reasonable effort to ensure you have the opportunity to make up any assignments associated with the absence. If you are late submitting an assignment associated with an unexcused absence or for a reason unrelated to missing class, the instructor may grade the assignment as time allows.

If an exam is missed because of an excused absence, the instructor will make every reasonable effort to ensure you have the opportunity to make it up. If the absence is unexcused, a make-up exam may be allowed at the instructor's discretion. If a lab is missed, it may be difficult to arrange for a student to make it up due to supplies and logistical constraints. If the absence was excused, the instructor may need to substitute an alternate activity.

Library research

Through your association with Ball State University, you have access to an academic research library

with many useful materials. This includes online access to many peer-reviewed scientific journals through bibliographic databases to which Ball State subscribes. To access these databases, go to <https://www.bsu.edu/library>, and scroll down to "Databases". The databases are listed in alphabetical order by the first letter. Two good ones to try are Academic Search Complete under "A" and JSTOR under "J". PubMed is good for topics in nutrition, microbiology, biomedicine, biotechnology, genetics, and cellular and molecular biology. When you click on one of these databases, you will be prompted to log into your Ball State account. You can search for articles on particular topics and then access the full text of many articles from the journal publishers' websites.

Also, if you are logged into <https://my.bsu.edu>, try searching on Google Scholar at <https://scholar.google.com>. You should see "Find it at Ball State" for references available through university subscriptions.

Student accommodations and special circumstances

If you have an IEP or a 504 that provides accommodations, have emergency medical information to share, or need special arrangements in case the building needs to be evacuated, please make an appointment with the instructor as soon as possible.

If you are struggling with study habits, stress, and/or personal issues, I encourage you to discuss the situation with your SLC and/or contact the Guidance Office for help in addressing these issues so that you can thrive at the Academy. Many resources are available for students, and important contact information is listed below:

For guidance: Meg Wright (mewright@bsu.edu), phone:765-285-7407; office: WA183.

To find a tutor: Meg Wright (mewright@bsu.edu), phone:765-285-7407; office: WA183.

For mental health: Dr. Mindy Wallpe (mcwallpe@bsu.edu), phone: 765-285-5483; office: WA 160-C.

Course evaluations

At the end of the semester, each student will have the opportunity to evaluate the course, instructor, and materials. The instructor will not see the results of the evaluations until after grades have been submitted. Your frank and constructive responses will help improve the course for future semesters.

INDIANA ACADEMY INCLUSIVE EXCELLENCE STATEMENT:

Ball State University aspires to be a university that attracts and retains a diverse faculty, staff and student body. We are committed to ensuring that all members of the community are welcome through valuing the various experiences and worldviews represented at Ball State and among those we serve. We promote a culture of respect and civil discourse as expressed in our Beneficence Pledge. As a reflection of Ball State's commitment to respect, civil discourse, and the Beneficence Pledge, Inclusive Excellence at the Indiana Academy emerges as one of the priorities of our living and learning community. We strive to exist together respectfully and compassionately, creating an environment where every member can thrive. Unfortunately, there might be occasions when something occurs that disrupts our progress toward meeting these objectives. In this case, we encourage any member of the Academy community to file a Campus Climate Report (CCR)

https://bsu.qualtrics.com/jfe/form/SV_6mbRbL5acAntUTI. All reports will be taken seriously, and appropriate responses will be carried out by Academy administration.

Schedule (subject to revision as needed)

12 August	Introduction to class, safety (school, lab, and field), lab safety worksheet
14 August	Ecosystems, food chains and webs, trophic levels, energy flow, and the 10% "rule"
15 August	AP Environmental Science "Big Ideas", introduction to science practices
16 August	The hydrologic (water) cycle, the carbon cycle
19 August	Nitrogen and phosphorus cycles
21 August	Aquatic and terrestrial biomes, primary productivity
22 August	Collect samples for AP Lab 1 Net primary productivity of aquatic plants
23 August	Community ecology: species interactions
26 August	Collect final data for AP Lab 1 Net primary productivity of aquatic plants
28 August	Community ecology: community attributes such as species diversity
29 August	AP Lab 6 Soil microbial activity and soil organic matter
30 August	Complete measurements for AP lab 6, biodiversity, island biogeography
4 September	Ecosystem services, ecological tolerance and natural disruptions to ecosystems
5 September	AP Lab 2 Species diversity, AP Lab 3 Habitat loss & transformation
6 September	Adaptations
9 September	Ecological succession, tree identification walk
11 September	Review session for exam 1
12 September	Exam 1 over Units 1 and 2
13 September	Populations, generalist and specialist species
16 September	K-selected and r-selected species, survivorship curves
18 September	AP Lab 4 Population estimation
19 September	Population simulation exercise, predator-prey simulation
20 September	Carrying capacity
23 September	Population growth and resource availability
25 September	Age structure diagrams
26 September	AP Lab 5 Human population ecology: Cemetery demographics
27 September	Total fertility and human population dynamics
30 September	Demographic transition
2 October	Review session for exam 1
3 October	Exam 1 on Unit 3 (populations)
4 October	Parent-teacher conferences (or by Zoom earlier in the week)
9 October	Plate tectonics, geology lab
10 October	Tuesday labs meet on Thursdays, so no Environmental Science lab
11 October	Soil formation and erosion
14 October	Soil composition and properties
16 October	Earth's atmosphere
17 October	Collect soil samples
18 October	IU Youth Environmental Leadership Summit
21 October	Global wind patterns, COP 16 begins in Colombia
23 October	Watersheds, solar radiation and Earth's seasons
24 October	Soil analysis lab, AP Lab 7 Physical and chemical properties of soil
25 October	Earth's geography and climate

28 October El Niño and La Niña
30 October Review for Unit 4 exam
31 October Unit 4 examination
1 November Earth systems and resources, land and water use
4 November The tragedy of the commons
6 November Forests and forestry
7 November Meteorology lab, dendrochronology lab
8 November Clearcutting, sustainable forestry
11 November The Green Revolution and impacts of agricultural practices
13 November Meat production methods, overfishing, aquaculture
14 November AP Lab 8 Soil compaction in agriculture, plant seeds
15 November Irrigation methods and pest control methods
18 November Integrated pest management, sustainable agriculture
20 November Mining, ecological footprints
21 November Measure taproots from AP Lab 8, forest survey lab
22 November Urbanization, methods to reduce urban runoff
2 December AP Lab 9 Sustainability, EN-ROADS
4 December Review session for Unit 5 examination
5 December Unit 5 examination
6 December AP Lab 19 Carbon sequestration in urban trees
9 December Essay writing practice
11 December Rubric setting
12 December Essay grading exercise
13 December Review for final examination
16-19 December Final exams