

The Indiana Academy for Science, Mathematics, and Humanities
SCI04327 AP Environmental Science I
Fall 2026

Instructor: Donald Winslow, Ph.D.

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Office hours: Monday 11 AM-12 PM, 1-2 PM, 3-4 PM
 Wednesday 11 AM-12 PM, 1-2 PM, 3-4 PM
 Friday 11 AM-12 PM, 1-2 PM

These office hours are suggestions for when you might find me in my office. However, you are welcome to check to see if I am available at other times. Also, I may occasionally be elsewhere during the stated office hours, so it is best to make an appointment if you want to be sure to catch me. Walk-ins are welcome if I am available, though!

Teaching apprentice: Julia Rogers (julia.rogers@bsu.edu) is available to help you during class or for tutoring and studying sessions outside of class.

Class meetings: In Burris 211. MWF; Labs Tuesdays from in Burris 211

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: *Fall* – One year biology

Spring – Successful completion of fall semester AP Environmental Science or permission of Science Division Chair

Co-requisite: AP Environmental Science Lab (SCI04327L/04328L)

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.

I welcome input from students on how to develop this course.

Assignments:

The assignments for the course are shown in the table below.

Assignment	Points	Number	Total
Participation	70	1	70
Presentations	50	1	50
Lab reports	12	10	120
Homework	10	8	80
Lecture exam	100	4	400
Lab notebook	100	1	100
Service Project	25	1	30
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.

Participation and conduct:

I will assign a few points at the end of the semester to reflect your degree of participation in lab and lecture and your conduct. Participation requires being consistently present (i.e., few unexcused absences) and engaged in course content, discussions, and activities. Good conduct entails adhering to safety guidelines, being polite to others, and not causing disruptions. This will be done on a holistic basis; I do not intend to count every time you raise your hand or don your safety glasses.

Homework assignments:

The goals of homework are to review material that has been learned previously and/or to prepare for material that is to be covered in the coming weeks. Each homework assignment will be submitted on paper or on Canvas, and most will be worth 10 points or less. Homework assignments will be graded for correctness and completeness.

Laboratory activities:

Lab activities will permit hands-on exploration of concepts learned in class. Most lab reports will be submitted individually by each student on Canvas on a due date set by the instructor. Some may be turned in on paper in class if the instructor decides that is appropriate for the exercise. Each lab assignment will be worth 10 points. During some labs, students will work with lab partners. Please review the lab exercise and any relevant training materials before lab so that you know what you are doing before you begin. Please check your email and Canvas regularly for any updates. Lab reports will be graded based on completeness and correctness. In addition, certain lab reports are to be written in the form of a research report. Research reports are similar in format to primary research articles published in peer-reviewed journals. Research reports will be graded based on completeness, format, and reasoning.

Presentations:

To make sure that I do not do all the talking in the course, we will schedule time for you to present course material and explore topics that interest you. Your presentation will be worth 50 points. I will assess the presentation especially on accuracy and how well you handle questions. I will also consider preparation, articulation, and engagement.

Examinations:

There will be four tests during the semester plus one comprehensive final exam. Exams will include multiple choice and free response questions similar to questions you may encounter on the Advanced Placement Environmental Science exam in May. Exams will be worth 100 points, except that the final exam will be worth 150 points. I will assess your answers based on completeness and correctness following rubrics developed by College Board.

Lab/field notebook:

Keep lab and field observations in a notebook dedicated for that purpose. Hand it to me at the final exam, and I will flip through it. I will assess your notebook based on completeness. The lab notebook is worth 100 points.

Environmental action service project:

The environmental action service project is an opportunity for you to serve your community and your world by addressing an environmental issue. It can be a project of your own design, or you may assist an environmental organization. You could organize a trash pick-up at a local park, improve recycling

and sustainability efforts at the Academy, ask a local environmental group if there are tasks you can help with, or something else. You will submit a report and reflection on your project on Canvas. You will be assessed based on description of your objectives, what you did, what you accomplished, and what you learned.

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 class for any reason, you are responsible for obtaining any notes, announcements, reading materials, 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). It is also necessary to tell a school nurse, a school mental health professional, or Attendance Coordinator Renee Drumm. The Academy and not the instructor determines whether an absence is excused or unexcused. Unexcused absences may reduce the number of participation points you earn (see above under Assignments). Also, you will have a much greater chance of success if you are present as much as possible.

Indiana Academy Attendance Policy

Attendance is mandatory. Students may receive excused absences at the professional discretion of the school nurse, the associate director of mental health services, the associate director of college counseling and student engagement, the director of academic affairs, and the executive director of the Indiana Academy. Unexcused absences occur when students miss class without prior approval from the aforementioned designated school officials. Continued absences (both excused and unexcused) from Academy classes increase the likelihood of unsuccessful completion.

Alongside steady attendance, students are expected to maintain consistent healthy habits of decorum, respect, and kindness towards their classmates, instructors, and teaching assistants. When students fail to meet these classroom behavioral standards and academic habits, it is the expectation faculty engage appropriately to bring quick and immediate resolution. When students consistently fail to meet these behavioral standards and academic habits in the classroom, administrative action will be taken involving, but not limited to, parent/guardian communication, removal of privileges, administrative withdrawal from the classroom, suspension, and expulsion.

Safety

Please familiarize yourself with lab safety protocols and perform procedures with care. Because we hold class in a science lab, no food, gum, or drinks can be brought into the classroom. Your work area should always be free of clutter and only have the necessary materials (pens/pencils, notebook, etc.). If there are glassware breakage or equipment problems, please notify the instructor immediately to ensure proper safety and equipment protocols are followed.

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 together as a class, 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.

Artificial intelligence (AI) technology

Technologies referred to as “artificial intelligence” (AI) are becoming increasingly salient in our lives. 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.

These tools can be very useful, from simple spellchecks to the generation of 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 learning tool but not as a finished product. Find the original sources of information and cite those. ChatGPT sometimes invents references that do not exist, so make sure you look at original sources of information. Do not paste auto-generated content into your paper as if it were your own work; this is academic dishonesty.

We may have occasion to use artificial intelligence tools in class. Perhaps you will want to use such tools outside of class when you are working on assignments for class. I do not recommend using large language models for writing, because I want to read what you have to say rather than something generated by a computer. The papers you write for this course will be based on your own research, so you should expect to write them yourself rather than try to develop a prompt to direct ChatGPT or another language model to do so. You may use spellcheck and grammar tools to proofread your writing. If you do use AI, please acknowledge your use and describe how you used it. If a paper presents auto-generated content as if it were written by the student, I will not grade it. You can cite AI tools following my example here.

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. A new Indiana state law does not permit phones to be used in the school building at all. We will often use laptops in class for class activities, but do not use laptops or tablets for non-class activities. A calculator (but not a phone) may be used for exams.

IA Wireless Device Policy:

Per Indiana Code 20-26-5-40.7, each school corporation must adopt and implement a wireless communication device policy that:

- Prohibits a student from using a wireless communication device unless directed by the classroom teacher for educational purposes only.

If required for participation in classroom instruction, a teacher may direct students to use only laptops or tablets. Cellphones, gaming devices, and smartwatches may not be used and must always be stored in a residential room, locker, backpack, or cellphone holders in the classroom. Students are prohibited from using any wireless communication device in the hallways, bathrooms, and all other locations inside the instructional building unless directly instructed to by a teacher. Students violating this policy may have their phone taken by a Burris or Indiana Academy school official for the remainder of the day. Phones can be picked up from the school office at the end of the instructional day. Repeated violations of this policy will result in further consequences as outlined in the Student Handbook. This policy does not apply to the residential hall (Wagoner/Elliott) except when a teacher temporarily holds a class session in a location other than the Burris Laboratory building. This policy does not apply to Ball State University courses or other Ball State University buildings.

Because you are not allowed a phone in class but must authenticate on a computer to use the Ball State networks, I suggest that you obtain a hardware token from the technology office at the Bracken Library. This will allow you to authenticate without using your phone. Until you have a hardware token, you may use your phone for authentication purposes only if you put it away as soon as you are connected.

Please treat each other with respect and refrain from annoying behavior. Do not interrupt another student or the instructor. Raise your hand if it is challenging to find an opportunity to speak. 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, I 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 or homework associated with an unexcused absence or for a reason unrelated to missing class, I may grade the assignment as time allows. Late assignments can generally be submitted on Canvas or on paper in my mailbox, depending on the assignment.

If a test or quiz is missed because of an excused absence, I will make every reasonable effort to ensure you have the opportunity to make it up. Make an appointment with me to take it in my office. If the absence is unexcused, a make-up test or quiz may be allowed at the instructor's discretion. For a make-up test resulting from an unexcused absence, a 10% penalty will be deducted from the score for each day after the scheduled test date until the make-up test is taken.

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. If you miss a lab or other in-class activity, arrange a time with me when you can complete the 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 click on "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 also very good for finding information on nutrition and the biomedical sciences. 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://myballstate.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 to speak with me 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 Student Life Counselor 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; Elliott B007A.

To find a tutor: Meg Wright (mewright@bsu.edu), phone: 765-285-7407; Elliott B007A.

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

INDIANA ACADEMY BENEFICENCE STATEMENT:

Ball State University aspires to be a university that attracts and retains outstanding faculty, staff, and students. Ball State is committed to ensuring that all members of the campus community are welcome through our practice of valuing the varied experiences and worldviews of the people whom we serve. We promote a culture of respect and civil discourse as evident in our Beneficence Pledge. As a reflection of Ball State's commitment to respect, civil discourse, and the Beneficence Pledge, inclusiveness 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.

Schedule (subject to revision as needed)

10 August	Intro to class, course planning, class safety, field safety, syllabus, scientific method
11 August	Lab safety, lab safety worksheet, donning and doffing gloves, science practices
12 August	Scope of environmental science, big ideas in environmental science, AP Classroom
14 August	Ecosystems and trophic interactions, food chains & food webs, 10% "rule"
17 August	Aquatic and terrestrial biomes
18 August	Collect samples for AP Lab 1 Net primary productivity of aquatic plants
19 August	Hydrologic (water) cycle, carbon cycle, primary productivity
21 August	Collect final data for AP Lab 1 Net primary productivity of aquatic plants
24 August	Nitrogen and phosphorus cycles, Community ecology: species interactions
25 August	Community ecology: community attributes such as species diversity
26 August	Biodiversity measurement and conservation, climate change
28 August	Island biogeography, generalist and specialist species, ecosystem services
31 August	Ecological tolerance & natural disruptions in ecosystems, ecological succession
1 September	AP Lab 6 Soil microbial activity and soil organic matter
2 September	Complete measurements for AP Lab 6
4 September	Parent Shadow Day (Learning without Limits Day), evolution & adaptation
5-8 September	Labor Day Extended Break (no class)
9 September	Microevolution and macroevolution, review session for exam 1
11 September	Exam 1 on AP Units 1 and 2 (communities, ecosystems, biomes, and biodiversity)
14 September	Populations, K - & r -selected species, mark/recapture method, dispersion
15 September	AP Lab 2 Species diversity, AP Lab 3 Habitat loss & transformation
16 September	Population dynamics, carrying capacity, invasive species, age structure
18 September	Resource availability and limits to growth, tree identification walk
21 September	Total fertility and human population dynamics
22 September	AP Lab 4 Population estimation, Dall sheep life tables and survivorship curves
23 September	Demographic transition
25 September	Youth Environmental Leadership Summit, IU Bloomington
28 September	Predator-prey simulation
29 September	AP Lab 5 Human population ecology: Cemetery demographics
30 September	Population simulation exercise
2 October	Earlham College...?
5 October	Review session for exam 2
6 October	Exam 2 on Unit 3 (population)
7 October	Plate tectonics and geology, geology lab

9 October	Soil formation and erosion, soil composition and properties	
10-18 October	Fall Break (no class)	
19 October	Earth's atmosphere	
20 October	Collect soil samples	
21 October	Global wind patterns	
23 October	Solar radiation and Earth's seasons	
26 October	Watersheds, Earth's geography and climate	
27 October	Soil analysis lab, AP Lab 7 Physical and chemical properties of soil	
28 October	Estimate % sand, silt, and clay for AP Lab 7 on properties of soil	
30 October	Ocean currents, El Niño and La Niña	
2 November	Review for Unit 4 exam, Earth systems and resources	
3 November	Unit 4 examination (exam 3) over Earth systems and resources	
4 November	Discuss Unit 4 examination questions	
6 November	Land and water use, the tragedy of the commons	
9 November	Forests and forestry, course evaluations	
10 November	Meteorology lab, dendrochronology lab	
11 November	Clearcutting, sustainable forestry	
13 November	Species and ecosystem conservation approaches	
16 November	The Green Revolution and impacts of agricultural practices, irrigation methods	
17 November	AP Lab 8 Soil compaction in agriculture, plant seeds	
18 November	Impacts of agricultural practices, sustainable agriculture	
20 November	Integrated pest management, approaches to agriculture	
23 November	Irrigation, pest control, meat production methods	
24 November	Measure taproots from AP Lab 8, forest survey lab	
25-29 November	Thanksgiving Break	
30 November	Overfishing & aquaculture (Julia), mining	
1 December	AP Lab 9 Sustainability, EN-ROADS	
2 December	Urbanization, reducing urban runoff, ecological footprints, review for Unit 5 exam	
4 December	Unit 5 examination	
7 December	Essay writing practice, rubric setting	
8 December	AP Lab 19 Carbon sequestration in urban trees	
9 December	Make-up day for presentations	
11 December	Review session for final exam	
14-17 December	Finals week: final exam in BH211	Lab/field notebook due at final exam