Indiana Academy for Science, Mathematics, and Humanities
SCI04328 AP Environmental Science (APES) II Spring 2025

Instructor: Donald Winslow, Ph.D.
donald.winslow@bsu.edu Office: Elliott Hall B008E Phone: (765)285-7463
Office hours: MWF 12:45-1:45 PM, 5-6 PM
Tuesday 10 AM-12 noon, 2-3 PM
Thursday 11 AM-12 noon
Class meetings: In Burris 211. MWF 2-2:50 PM, Lab on Thursdays 2-3:45 PM.

Description from the course catalog (**https://academy.bsu.edu/catalog/**):

Prerequisite: One year biology
Spring – Successful completion of fall semester APES or permission of Science Division Chair
Co-requisite: AP Environmental Science Lab (SCI04328L)
Credit: 1.5 credits
Offered: Spring

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.

* Ball State University offers 3 college credit hours in NREM 101 to students who complete this course. Refer to the Dual Credit section for details on enrollment and fees.

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 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.

Dual Credit

Students may choose to enroll in Ball State's Dual Credit Program to earn college credit for NREM 101, Environment and Society, from Ball State at a reduced rate of tuition. Students eligible for free or reduced lunch this academic year may enroll at no charge if verified by the school. Free and reduced lunch students will still be responsible for any textbook costs associated with the dual credit course.

To enroll in Ball State's Dual Credit Program, students should have a 3.0 GPA on a 4.0 scale and complete the application & registration process before the given deadline. Ball State will bill students via postal mail; no money should be submitted to the high school. College credit can only be earned during the semester (or, in the case of year-long classes, during the academic year) in which the student is enrolled. Late enrollments are not permitted.

Whether college credit earned through dual credit courses will be accepted by another institution of higher education is determined by the college or university to which a student is seeking admission. Before enrolling through Ball State's Dual Credit Program, students should check directly with that institution to determine if a course will be accepted and how it will be counted toward graduation requirements. Refunds will not be issued if Ball State credits are not able to be transferred. In most cases, students will need to earn a C or better to transfer credit from Ball State to another institution. Grades of D or lower earned in Ball State Dual Credit courses are recorded on a student's Ball State transcript but may not be able to transfer.

The rigor of this course will be periodically reviewed by Ball State University faculty in an effort to maintain the high quality of education that each student receives. To learn more about Ball State's Dual Credit Program, visit bsu.edu/dualcredit, call 765-285-1581 or email dualcredit@bsu.edu. See the Dual Credit syllabus for this course published on Canvas for more information.

Assignments

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

Assignment	Points	Number	Total points
Participation (assigned once per quarter)	25	2	50
Workbook exercises	8	5	40
Homework	10	5	50
Lab reports	10	20	200
Quizzes	8	5	40
Examinations during semester	100	3	300
Proposal for environmental advocacy project	20	1	20
Environmental advocacy project	30	1	30
Presentations	25	4	100
Lab notebook	20	1	20
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. **Please make an appointment to talk with me if you are concerned about your grade or uncertain about your standing in the course.**

Participation—I will subjectively assess the extent to which students participate in discussions, laboratory exercises, and fieldwork in order to award participation points.

Workbook exercises—Workbook exercises will be from the lab manual by Molnar. I will assess papers based primarily on correctness, completion, and clarity.

Homework—Students will complete homework assignments throughout the semester. I will assess answers to homework questions and problems based on correctness and completeness.

Lab/field investigations—We will complete lab- and/or field-based investigations from College Board, the lab manual by Molnar, or other sources. Some studies we will design ourselves. For most investigations, each student will be expected to submit an original report that describes the background, methods, results, and findings. I will assess reports based on completeness, organization, correctness of analysis, and justification of conclusions.

Quizzes—We will have a few quizzes in class, on Canvas, and/or on AP Classroom. Quiz questions will be multiple choice, short answer, or matching. I will assess answers based on correctness, completeness, and clarity.

Examinations—Exams will cover material from the textbook, especially what we discuss in class. There may be additional exam questions based on discussions we have of other readings. The final exam will be comprehensive. Exam questions will include multiple choice and free response questions. I will grade answers based on correctness, completeness, and clarity.

Environmental Advocacy Project—Each student will complete an environmental advocacy project. This will entail communicating the student's opinion on an environmental issue to a decision maker, a constituency, or the general public. The project may involve commenting on a government action, tabling or distributing flyers, writing a letter to a decision maker, or promoting an Internet meme. A proposal will be submitted early in the semester so that I may assess the appropriateness and feasibility of the project. The final report for the project will describe the action that was taken and reflect on the experience. I will assess the report based on completeness and clarity.

Presentations—Students will have several opportunities to give presentations to the class. This will include covering review topics early in the semester, reporting on the results of a student-directed soil investigation, description of various forms of energy generation, and sharing environmental advocacy projects. I will assess presentations based on clarity of communication.

Lab notebook—Each student will maintain a lab notebook with observations, drawings, and data from lab and field exercises. This notebook will be submitted at the end of the semester. You may bring it to the final exam, and I will look through it while you take the exam. I will assess the notebook for neatness, completeness, and attention to detail.

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". 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)

6 January	Review final exam from 1st semester, review syllabus, dual credit, course planning	
8 January	Scope of environmental science	Friedland & Relyea Module 0
9 January	Geology and map lab, Indiana geology, plant lettuce	Melhorn's *Indiana on Ice* (see Canvas)
10 January	Geological processes, rock types, Molnar Investigation 2,	Friedland & Relyea Module 19
13 January	Soil texture & physical properties	Friedand & Relyea Module 20
15 January	Student presentations: irrigation, fishing, mining	Friedland & Relyea Modules 27-29
16 January	Rock weathering and soil formation lab, student presentation on soil nutrients & properties	
17 January	Student presentations: atmosphere, agriculture; soil lab	Friedland & Relyea Modules 22, 25-28
22 January	Student presentations: greenhouse effect, climate change	Modules 23, 56-57
23 January	Design student-directed soil investigation, Molnar Investigation 9, geology and soils quiz	
24 January	Air resources, particulates, smog, inversions, CO_2	Friedland & Relyea Modules 42-43
27 January	Indoor air, radon, radon testing, soil proposal due	Friedland & Relyea Module 44
29 January	Clean Air Act, reducing air pollution, effects of S & N	Friedland & Relyea Module 45
30 January	Effects of sulfur and NO_x on plants	College Board AP Lab 13
31 January	Acid rain, noise pollution, global air issues, S & N	Friedland & Relyea Modules 46, 55-57
5 February	Review for exam 1, Molnar Investigation 4	Friedland & Relyea Unit 7
6 February	Examination 1	
7 February	Molnar Investigation 32	Environmental advocacy proposal due
10 February	Particulate matter & indoor air pollution: Molnar Investigation 27, College Board AP Lab 12	
12 February	Collect air quality data, atmosphere and air quality quiz, Molnar Investigation 1-4	
13 February	Soil survey field trip	

14 February	Valentine's Day, atmospheric CO_2	Molnar Investigation 1-5
17 February	Biodiversity	Unit 2, Module 59, collect O_3 data
19 February	Populations, invasive species	Friedland & Relyea Unit 3
20 February	Soil texture & physical properties (student-directed investigation), Molnar Investigation 9	
21 February	Forests and forestry, forest carbon dynamics	Friedland & Relyea Modules 24, 34
24 February	Student presentations on soil analysis	Student-directed soil report due
26 February	Discussion on *American Environmentalist* readings	Black Elk, Rachel Carson, Thoreau
27 February	Squirrel population investigation	Forest homework due
28 February	Parent-teacher conferences	
10 March	Mature and old-growth forests, interpreting journal articles	Journal article assignments
12 March	Forms of energy generation, forest quiz	Friedland & Relyea Modules 35-38
13 March	Regional Envirothon	Rinard Greenhouse
14 March	Energy conservation, renewable resources	Friedland & Relyea Modules 39-41
17 March	Sustainable energy, student energy presentations	Environmental energy problems
19 March	Urban ecology, solid waste, birdwatching, energy quiz	Friedland & Relyea Modules 30, 50
20 March	Energy efficiency lab, insulation lab, tree ring analysis	College Board AP Lab 10
21 March	Sources of aquatic and terrestrial pollution	Friedland & Relyea Module 47
24 March	Watersheds, irrigation, water quality, aquatic biomes	Modules 21, 27, 49, 3
26 March	Review session for exam 2, energy and recycling	Molnar Investigation 8
27 March	Examination 2	
28 March	Water pollution, sewage treatment	Friedland & Relyea Modules 48, 54, 52
31 March	Health effects of pollution, hydrologic resources	Friedland & Relyea Modules 54, 5, 48
2 April	Environmental laws, waste reduction	Friedland & Relyea Module 51
3 April	Biofuels lab, geothermal energy exchange lab	College Board AP Lab 11
4 April	Ocean acidification, sustainability	Friedland & Relyea Module 58, 32,33
7 April	Course evaluations, migrant songbirds, local toxic sites	Molnar Investigation 1-10
9 April	Benthic macroinvertebrate lab	Molnar Investigation 1-1 for reference
10 April	White River field trip	College Board AP Lab 14
11 April	Review session for exam 3	
14 April	Chemical testing lab	College Board AP Lab 14
16 April	Chemical testing lab	College Board AP Lab 14
17 April	Examination 3	
18 April	Planting radishes in courtyard, wildflower field trip	Wildflower photo album
23 April	State Envirothon competition	https://indianaenvirothon.org
24 April	Salt toxicity lab (see also Molnar Investigation 10)	College Board AP Lab 16
25 April	Ocean acidification lab	College Board AP Lab 1
28 April	Salt toxicity lab	College Board AP Lab 16, Module 53
30 April	Wildfire, global environmental problems, water quiz	Environmental advocacy project due
1 May	Student environmental advocacy presentations, review session for final examination	
2 May	Review session for Advanced Placement exam	
5-9 May	Finals week, final exam time to be announced	Lab/field notebook due at final exam